



The
University
Of
Sheffield.

Disassembly and Assembly in the Malay Building Culture

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A thesis submitted in fulfilment of the
requirements for the degree of Doctor of Philosophy

The University of Sheffield
Faculty of Social Sciences
School of Architecture (SSoA)



ands

15th October 2018

Disassembly and Assembly
in the Malay Building Culture

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Bound and Submitted. July 2017

Viva Presentation. September 2017

Correction Submitted. October 2018

PhD Awarded. January 2019

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Typeset in Calibri

Size 9.5 / 10.5 / 12

The text and layout were composed with Microsoft Word® and figures with Preview® (Mac), Adobe Illustrator® and Adobe Photoshop®.

Other software adopted for research was Evernote®, Nvivo® and Photos® (Mac).

Printed and bound in Sheffield, GB.

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Abstract

Asian vernacular architecture is generally dynamic, progressing and constantly transforming. The significance of Asian vernacular values lies in the culture, identity and memory of the people rather than the fabric or preserved artefacts. Likewise, the vernacular traditional Malay houses are a manifestation of the craft process and meanings embodied in the people, their building practice and artefacts. However, the Malay building culture is diminishing while the numbers of tukang or master craftsmen is declining, which adds to the loss of traditional knowledge and skills in Malay house building culture.

The study investigates the traditional craft of Malay house-building within the present in order to identify the legacy of Malay craftsmanship concerning knowledge and skills of tukang and their apprentices. Furthermore, the study explores contemporary Malay building practice and inquiring how traditions were and continued to be conveyed towards building participants.

The unstructured interviews with tukang, experts and non-experts, while observing building activities were used to provide insights of the Malay house building culture within contemporary. The methodology adopted is relevant as much of the craft knowledge and skills are embodied and performed, rather than articulated in oral or literature.

The study concluded that Malay architecture is rooted not in the tangible built fabric but in the knowledge and dexterity of tukang and the craft process relating to materials, tools, measurement and bodily movement. Similarly, the meaning of Malay craftsmanship is defined by tukang and embodied in their practice. However, tukang is more than simply a builder but has a spiritual role that connects the Malay cultural beliefs to the Malay house and the building process. Hence, the study implies that the Malay house building is a form of a spiritual practice emphasising the value of culture, memory and religious identity rather than purely narrating the structures.

Furthermore, the findings of the study suggest that essential qualities of craftsmanship, knowledge and skills in Malay house-building are exemplified subliminally within the actions of buka-pasang or disassembly and assembly. The study demonstrates that the practice of disassembling and assembling existing Malay structures, was and still remain as a socially communicative act in transmitting building traditions.

The study characterised the disassembly and assembly as a building process involving dyadic knowledge of technical (strategy) and spiritual (cultural) that manifest the poetics, procedural, ritual and somatic means of Malay house-building culture. Therefore the study asserted that performing disassembly and assembly afford to a sense of retracing footsteps of past mastery as an embodied heritage experience – hence comparable to the apprenticeship-style of learning that demonstrates the process of mimetic, causal learning and reflective cognitive process.

Eventually, the study expresses that the values of Malay cultural heritage are not in the static heritage artefact, but the physical and spiritual interaction between artefacts and the people in the present. The answer to the loss of heritage and the decline of traditional building practice and knowledge it offers is through disassembly and assembly, where the study views this process as a catalyst in overcoming these shortcomings.

Acknowledgements

I wish to express my sincere appreciation to my main supervisor, Dr. Mark Meagher, for his constant guidance, wisdom and encouragement, without which this study would not have been possible. Similarly to Dr. Randal Lawrence, my co-supervisor, for his valuable expertise and contribution. Special thanks go to my second supervisor, Dr. Chengzhi Peng in overseeing and administering my study from the start.

I would like to express my sincere gratitude to Nor Izura for her support and patience throughout these challenging and exciting years, during which we were blessed with a beautiful daughter in 2014. My heartfelt appreciation for her sacrifices and struggles in raising Nuha and keeping the family well-balanced, while attending to her own Ph.D research.

I also take this opportunity to express my appreciation in the constant support and prayers from my beloved parents, family members and friends in the UK and Malaysia.

The study will not be fruitful without the comments and feedback from the external examiners, Professor Daniel Maudlin from University of Plymouth and and Dr Krzysztof Nawratek of Sheffield School of Architecture during the viva examination in September 2017.

My deepest appreciation for the contributions from the research subjects engaged during the fieldworks, to name a few: Tukang Jamalias Ismail, Tukang Azih Abd Rani, Tukang Syed Mohd Hanafiah, Encik Fauzi, Dr. Muhammad Pauzi Abd. Latif, Dr. Syed Iskandar Syed Arifin, Dr. Fawazul Khair Hj Ibrahim, Mr. Alex Lee Yun Ping, Cik Khairunnisa, Haji Mohd Yusof Abdullah and others.

Many thanks goes to Majlis Manah Rakyat (MARA) for their financial support and the life time opportunity to pursue my studies here in The University of Sheffield. The completion of my PhD would have been impossible without the support and advise from Dr. Ilias bin Said of Universiti Sains Malaysia.

I also place on record, my sense of gratitude to one and all who, directly and indirectly, have lent their helping hand and support in this study.

To everyone, I say *Terima Kasih Daun Keladi*.

Chapter One.

Study background

1.0 Introduction

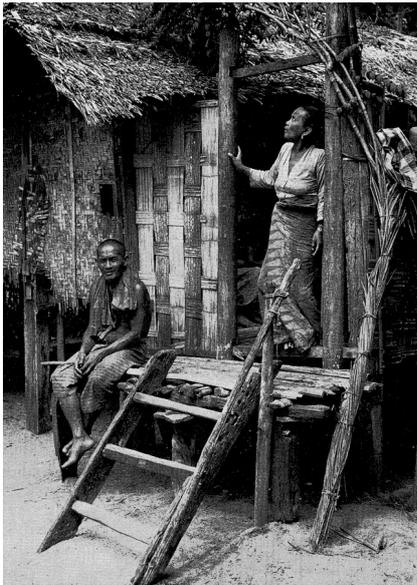


Figure 1.1 Typical primitive Malay house doorstep. Source: Firth, 1948.

Malay vernacular architecture is believed to be the quintessence of Malaysian architectural identity. The pursuit for the revival of Malay vernacular architecture and its indigenous values had been an aspiration to many, particularly for local architects and scholars. The traditional Malay house is considered part of the vernacular architecture that demonstrates the panacea to the ingenuity of Malay technical, cultural and spiritual doctrines that has existed in harmony. All of these elements make up to the success of Malay vernacular architecture that responds to the local context of the place, people and ultimately portraying an identity that could address the nation's distinctiveness.

However, the question remains, whether past accomplishment should be only a reminiscence, resurrected or given a new breath of life. Moreover, should the substance of heritage, particularly of the physical vernacular and traditional architecture, be preserved for the sake of exhibits and modern museological principles? And how should we answer these questions when contemporary modern architecture had substituted what was once considered the archetypal structures of local Malay living? These are critical issues in the architectural heritage that the study attempts to provide discussion to.

Parallel to other scholarships in vernacular architecture worldwide, the Malay building culture is constantly changing and adapting, thus proving it to be dynamic and fluid in response to the period of time. In due part, the dynamism is attributed to the transient nature of Malay architecture that is literally constructed from fabricated timber components which were intentionally meant to be replaced and relocated. Compared to the notions of Western built environment, particularly of cultural and historical significance, they are commonly built out of permanent materials; stones, bricks and partly large timbers. Therefore the Western principles of preservation are established in the authenticity of materials, which suggests that the emphasis on the values of

architectural artefacts are more significant than the conception of intangibility or immateriality.

In contrast, the essence of the traditional Malay house lies in the meaning perpetuated by the Malay community as well as in the knowledge and skills of craftsman and his craft process, rather than the built fabric of the house. Using the term *tukang*¹ to distinguish the Malay craftsmen, the study argues that the practice of the people who conceptualise, conduct and build Malay structures are the foundation in the legacy of the traditional Malay house and its building culture. This is reflected on Rapoport's (1990) statement that the 'process' and 'product' characterised the traits of vernacular architecture. While the 'product' refers to the physical form and artefact of a Malay house, the 'process' is concerning the practices of *tukang* or building participants. The attributes in the practices of *tukang* refers to the somatic activities accompanied by the rituals conducted, that are both material and spiritual; which gave thoughts to the dichotomies in the tangible and intangible matters advocated by heritage bodies such as UNESCO.

The study further suggests that the figure of *tukang* within the building culture is more than simply a builder but an inheritance of Malay building skills and knowledge as well as in the personification of Malay cultural beliefs. *Tukang* has a dominant spiritual role concerning religion, spiritual, customs, corporeal actions and nature, upon which they are instrumental to the development of the Malay community and the wider *kampung* (village) culture. It was recorded in the past that an individual *tukang* possesses the qualities of a craftsmen, a carver, a *pawang* (shaman) and an *Imam* (*ketua adat* or religious leader) that are responsible and appropriate to each phase of the Malay house-building procedure. Having said that, the significance of the Malay culture, identity and memory are depicted in the building process that are embodied in the materials, tools, measurements and the body movements of the *tukang* themselves. This places the built fabric of the preserved or reproduction of historic dwellings as secondary to the craft affairs and the meaning it entails within the Malay community.

¹ *Tukang* is a Malay word for craftsman or craftsmen. See explanation in section 1.1(iii).

² Austronesia refers to, 'a family of languages spoken in an area extending from Madagascar in the west to the Pacific islands in the east', or also referred to

The practice of *tukang* confirms to a generally accepted apprenticeship-style of learning and skills and knowledge transmission. The *tukang*'s role is to facilitate the participatory nature of the building process within an informal hierarchical relationship between *tukang*, house owners, apprentices, building participants and the communities associated with the *buka pasang* or disassembly and assembly method of Malay house-building. Subsequently, the process of disassembly and assembly justifies the impression of the house as 'living' not only in its symbolic meaning as evident in most Austronesia's² architectural practice, however is central to the constant reconstruction of Malay houses as part of their preservation strategy. The study considers this building method to a form of 'building craft' as it demonstrates the diligent creativity, dexterity and craftsmanship of the 'maker' in ways that a craft is exercised.

However, the diminish of traditional Malay house-building culture and its 'community of practice'³ is concerning as the legacy of *tukang* could be extinct, while the indigenous practice may be lost. The nature of the practice, which is generally oral-based transmission, was presumed to add to this unfortunate loss of tradition when master *tukang* are scarce. Nonetheless, due to the ephemeral building materials and transient nature of traditional Malay houses, the study strongly argues that the transmission of the Malay house-building culture in the present could be well established in the practice of present *tukang* and significantly in the disassembly and assembly process, performed in a manner rooted in Malay building culture.

As much of the building culture and the craft process is embodied rather than articulated in words or written form, the mnemonic, somatic and 'spiritual' interactions among the *tukang*, apprentices and other building participants as well as between them and the artefacts are thought to intentionally simulate the apprenticeship-style of house-building – in a form of practice which brings about the bodily disposition. The process is escalated through the poetic characteristics of the house and *tukang*'s or apprentice's performance in the disassembly and assembly that

² Austronesia refers to, 'a family of languages spoken in an area extending from Madagascar in the west to the Pacific islands in the east', or also referred to 'Malayo-Polynesian' (Oxford Dictionary of English).

³ The 'community of practice' is a group of people who share a craft, and in this case the Malay house-building culture. See: Lave & Wenger, 1991.

transpires the traditional Malay craft notion of *Guru Asal*; a medium that is spiritually inclined, transpiring centuries of Malay ideologies and inspirations embodied in masterpieces such as Malay houses.

Though the *Guru Asal* is mystical in nature, the study mentions the modern method of artefact inquiry such as the reverse-engineering. It is only a conceptual structure to technically understand disassembly and assembly process as a facilitator of the 'discovery' process. Therefore, the study hypothesises that this inquiry procedure is simultaneously a process of tacit or explicit skills and knowledge transmission. It refers to the process of retracing and re-enacting the procedural footsteps embedded in the Malay building culture through disassembly and assembly. In short, the qualities and values of Malay craftsmanship, past building knowledge and skills are exemplified subliminally within *tukang's* somatic actions, causal learning and interpretations of disassembly and assembly. The intangible or embodied practice of *tukang* or apprentices is demonstrated as tangible and eventually this heritage experience is believed to be making its physical place in their thoughts and convention.

The study draws evidence of the building culture from the existing body of secondary sources and expertise in Malay building culture. The study builds further with interviewing the living *tukang* and relevant personnel – including the experts and non-experts. The study hopes to demonstrate the need for the Malay building craft to be constantly initiated and conveyed into the local community at present, particularly in the re-enactment of the disassembly and assembly process. This eventually will perpetuate a new understanding and re-reading of a building culture that is embedded in the practice of the people and its community. Finally, Malaysia can path its way towards expressing its national identity in architecture that is always progressing and relevant in essence and context, be it in a form of physical artefacts or the performance of the people who build. Subsequent sections in this chapter will provide the background of the study and the context in which it intends to pursue.

1.1 Lexicon and Terminologies

The vocabulary of words used in the thesis is mostly from Malay terminologies. When translating the word origin into English, it could be

argued that the translation will be lost; hence its adaptation could be misguided. These terminologies describe the intent of the study and its contextual usage.

(i) Malay

The term Malay is the word to describe a specific group of people, which the study focuses on. It is an ethnic group, which was dominant within the *Malay Archipelago*⁴ or partly known now as Maritime South East Asia. The term Malay race, describes this expression to portray a racial category within the Austronesian population, however, the Malay this study focuses on are the ethnic group located primarily in Malaysia, which includes both an area of the Malay Peninsula and parts of Sumatra and Borneo. These Malay are further identified as Malaysian Malay, who are constitutionally defined as a group of Malay citizens or predominantly known as Muslim Malay. The preconditions for classification of a Malay person according to the constitutions are those who speak the Malay language (*Bahasa Melayu*), uphold the Islamic faith and practise the Malay tradition and customs. Interestingly, the broad classification also includes 'non-native' people who are married to Malays and meet the sets of conditions described.

(ii) Traditional Malay house

The traditional Malay house is a type of house generally inhabited by the Malay people of Malaysia. The house varies in style throughout Malaysia consisting of various elements depicting the Malay cultural variants and inclinations of each state. It can also be described as Malay architecture or *Rumah Melayu* (Malay house) in the Malay language, however, the additional expression of 'traditional' suggests that the association of such architecture should be made to explain a specific criteria. These include the type of construction, techniques used in building it and more importantly the timeframe (period in time) of the house. Though the study will not attempt to pinpoint a specific phase of time the building relates with, it is sufficient that the house is associated with the phase of developments in the building techniques used; the non-use of steel fastenings such as nails or nuts and bolts.

⁴ The area relates to the concept of the Malay race terminology commonly used by the 19th century Europeans. The regions consist of countries in the archipelago between mainland Southeast Asia and Australia.

The word 'traditional' could also be referred to the primitive, vernacular or popular architecture (Guidoni, 1987, p. 16)⁵; however it is neither any of it. As the traditional here is meant as the existing of form and habits that are commonly produced according to customs. These customs were long established by a certain group of people, where Malay people are associated.

Bronner (Bronner, 2006, pp. 24–25) summaries that the use of 'traditional to describe buildings is a reference to the structure as an object within broader category of vernacular or indigenous, although as a subject all vernacular dwellings embody traditions'.

To note, the term 'Malay house' without 'traditional' may also be used throughout the thesis to portray similar connotations, which carry the same meaning and intent.

(iii) Tukang or tukang

The definition of master craftsman or master *tukang* can be summarised as someone with knowledge and skill in building traditional artefacts such as the traditional Malay house. The Malay term *tukang* can be expressed and diversified into wood *tukang*, steel *tukang* or stone *tukang*, describing the appropriateness of his mastery in each different category of expertise, while the word *tukang* represents an accepted attribute that reflects the unique qualities pertinent to Malay culture. In this study, the term *tukang* is generalised to portray the expertise of a wood *tukang* or a person that builds and constructs the Malay house.

In this study, a *tukang* is defined as a person who builds traditional Malay houses. The Malay word *tukang* is a direct translation of the 'craftsman' or 'artisan'. It can also be described in a plural meaning of 'craftsmen' without any changes or additions to the word *tukang*,

'[An] artificer, a man skilled in any department of knowledge, especially manual; an artist, a wright, a craftsman, a manufacturer; an adept. The word is always prefixed to the trade of which he is designated as the exerciser' (Rigg, 1862)

⁵ Guidoni (1987) describes the expressions associated to denote 'traditional architecture' as (i) 'primitives': referring to the 'cultures and cultural products that are essentially different from ours and technologically less advanced than those of the Western countries and the great civilizations of the Orient' and (ii) 'vernacular': typically represents architectural thoughts that were 'uncultivated' or lacking the 'conscious style' resulting in an informal architectural quality. Meanwhile, (iii) 'popular' is understood as the 'lowest social classes within a highly stratified system' of architecture.

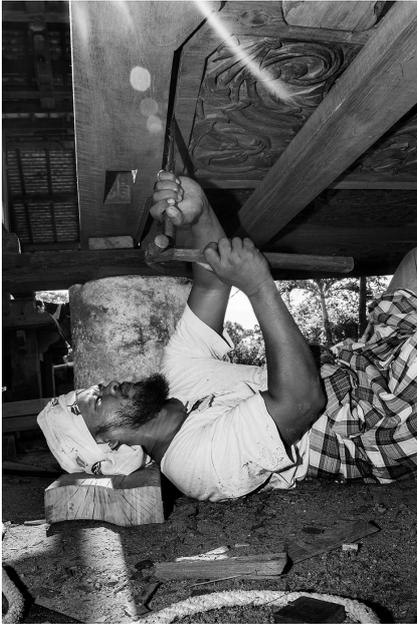


Figure 1.2 *Tukang* laying on his back on the ground while working, using simple hand tools. Source: ©Tolahah Photography.

although in the Malay language it is normally rendered as *tukang-tukang*. Nevertheless the word *tukang* alone is best translated as master craftsman (or craftsmen) and when ‘Malay *tukang*’ is used, this relates to a specific community of *tukang* albeit the study may only use the word *tukang* to describe a similar purpose.

The study prefers the term *tukang* rather than the literal and limited meaning of ‘Master Craftsmen’, as it does not express its significance to the Malay culture. The Malay word *tukang* demonstrates a deeper understanding of both the material and spiritual aspects of building a traditional Malay house where strict cultural and ritual inclinations are an integral part in the procedure of Malay building culture.

A *tukang* can be specifically described as a ‘wood *tukang*’ or ‘gold or silver *tukang*’, relating to the person’s trade or craftsmanship⁶. In this study, it is common to describe a craftsman who builds Malay houses as a ‘wood *tukang*’ (direct translation from the Malay word *tukang kayu*) due to the use of timber or wood as the main material for houses in the past; this therefore illustrates his area of specialisation. Again, the word *tukang* here simply represents a similar intention.

In chapters describing the subjects interviewed in the fieldwork, in particular the Malay craftsmen, the study adopted the word *Tukang* with a capital ‘T’ before their name to distinguish them from other subjects. This is to avoid confusion when explaining different subjects within the descriptions in the chapters. For example, a *tukang* in the name of Ustaz Jamal is mentioned as *Tukang Jamal* while *Tukang Azih* is used to describe another *tukang* encountered during the fieldworks, thus giving clarity in the distinction of their thoughts and arguments.

(viii) *Buka pasang* or disassembly and assembly

The *buka pasang* (disassembly and assembly) is literally translated as the action of disassemble and assemble which is used throughout this study. The use of *tanggam* affords to the actions of *buka pasang*, and thus the terminology is implied upon the building system of Malay houses. In the same way, the term is often used to designate the actions relation to

⁶ Similarly, the Malay word *pandai* (clever) denotes a person who is knowledgeable and skilled such as a *tukang*. Hence it is also used in parallel with the type of trade related ie. *pandai kayu* (master in wood) or *pandai besi* (master in steel). This is described in section 4.2.

building: *buka rumah* (reconstructing a house) or *pasang rumah* (building a house). Within the study, the *buka pasang* is considered as a technique and a process rather than expressing the actions. Likewise, the use of English wording will be primarily used throughout.

(ix) Guru Asal

Guru refers to a teacher, often associated with a religious one. The Oxford Dictionary defines it as either 'a Hindu spiritual teacher' or 'an influential teacher or popular expert', nonetheless both demonstrate the aspect of a resourceful 'master' with a great deal of knowledge and ability. Meanwhile, *asal* is translated as 'primary', 'genesis' or 'origin', hence the word *Guru Asal* is to describe the 'original' teacher, however in an abstract sense.

Similarly, an approach within Malay craftsmanship propagated by the late Nik Rashiddin⁷ defines *Guru Asal* as a medium that is spiritually inclined, exemplifying the lineage of past Malay craftsmen and craftsmanship embodied in masterpieces. The *Guru Asal* is meant to transpire centuries of Malay ideologies and 'inspirations' from physical artefacts such as a *Keris* and as argued by the study, could similarly emerge from traditional Malay houses, in addition to knowledge from other people. Wallace (2010) may have defined this as an expression of 'succeeding generations' of an artefact.

(iv) Semangat and Rasi

When talking about the traditional Malay house, it is important to understand that the house when completed exemplifies both physical and spiritual outcomes. Physically, the appearance of the house should portray a high level of Malay craftsmanship, which is aesthetically pleasing and represents the status of the occupants. On the other hand, the spiritual aspect is achieved when the occupant feels at ease with the house in relation to their somatic as well as psychological state. This is



Figure 1.3 The late Nik Rashiddin Nik Hussein (1955-2002). Source: www.journeymalaysia.com/Akademi_Nik_RashiddinKerisMelayu

⁷ Nik Rashiddin Nik Hussein is a master craftsman well known as a wood carver. He was born on the East Coast of Peninsula Malaysia in Kelantan, and produced skilled Malay carvings, especially in *Keris* (Malay weapon). Many of his masterpieces are currently exhibited in Akademi Nik Rashiddin or known as Kandis Resource Centre in Kelantan after he passed away in 2002. The Centre is a vision of his legacy in Malay craftsmanship for researchers, art lovers and artists to gain information and exchange ideas in regards to Malay culture and traditional masterpieces.



Figure 1.4 Gotong-Royong in relocating a house from one place to the other. Source: www.sinarharian.com.my/edisi/perak/angka-at-rumah-beramai-ramai

known as *semangat* (soul-substance), that resides in almost every being. It is a spirit of life and vitality⁸. In the words of Fraser (1960, p.171):

‘Semangat manifest itself in a man a sense of strength (..) feeling of helpfulness or good. (..) To lose semangat is like the sensation that comes with fear’.

The connection with the house is normally associated with the spirit of the house or house *semangat* known as to achieve the feeling of *rasi*. Ariffin (2000) expressed the definition of *rasi* as fitness, suitability and comfort of the occupants with the house as well as its house *semangat*. In other words, *rasi* is considered as the affect of proportions or harmony in the tangible and intangible aspects of the Malay building culture.

(v) Kampung

The Malay village is called a *kampung*; a rural settlement consisting of traditional houses within a compound, surrounded by lush trees. Cluster settlements are found in the paddy lowland fields while the linear settlements form along a river and roads. It is the smallest political unit within the Malay population. A unit of ‘common residence,’ ‘of kinship and economic cooperation’ (Gullick, 1965, p. 22) and social organisation within a settlement as well as religious boundaries (Fraser, 1960, pp. 101–104). The *kampung* forms a sustained traditional community rich in sustenance activities such as fishing and agricultural practices.

The layout of the *kampung* is randomly placed, divided with the Malay houses, trees, paddy plantations, compounds and pathways. It has no geometric order as it is based on the social relationships, cultural and social aspects of its inhabitants (Lim, 1987, p. 91). More importantly the *kampung* has an order of ‘symmetry with nature’, hence the abundance of lush surrounding greenery due to traditional beliefs where interventions towards the environment are kept to a minimum (Gibbs, 1988, p. 13).

⁸ R.J Wilkinson, A Malay-English Dictionary, II, p.419 as quoted in Fraser, 1960, p. 171.

(vi) Gotong-royong

Gotong-royong is defined as collective action or the mutual assistance that was an important feature within the *kampung* community. This is believed to occur due to the condition and habit of past Malay communities but also reflects towards the qualities of a *kampung* inclined towards an open community. In the past, work culture occurred communally as the absence of machinery required collective skilled human labour in order to complete tasks. Equally important is the unique characteristic of the *kampung*, which promotes shared understanding in terms of space and activities, hence the numerous Malay ceremonial feasts held within the community.

In the tasks of building a Malay house, the concept of *gotong-royong* is used throughout and even extended after the house was built. Activities related to house relocation and reconstruction that requires the help of *kampung* people is part of *gotong-royong*. The study defines *gotong-royong* in the form of two or more persons working together and helping each other achieve a common goal that is normally beneficial to the community. In the building of a Malay house, the advantage lies in the gatherings and the harmonious interactions between the occupant and the wider community.

(vii) Tanggam

Tanggam is a wood joinery system adopted by Malay *tukang* in the assembly of Malay houses when nails and screws were absent. The use of steel fasteners such as nails and screws were uncommon in addition to the nature of the building system that was meant to be temporary and not fixed. The connection uses mortise and tenon joints, adjoining perpendicular timber pieces and as a result the layout of the house was generally square. At times, wooden dowels or *baji* (timber wedges) or both, acted as additional fasteners in order to reinforce the connection. Though *tanggam* is considered a basic system, it is simplified and strong, appropriate for a Malay house.

(x) Other terminologies

The study also uses other Malay terminology such as *Tiang Seri* (main pillar or column), *baji* (wooden wedges) and others that simply relate to the aspect of disassembly and assembly process. Malay words will be accompanied with footnotes for descriptions and details.

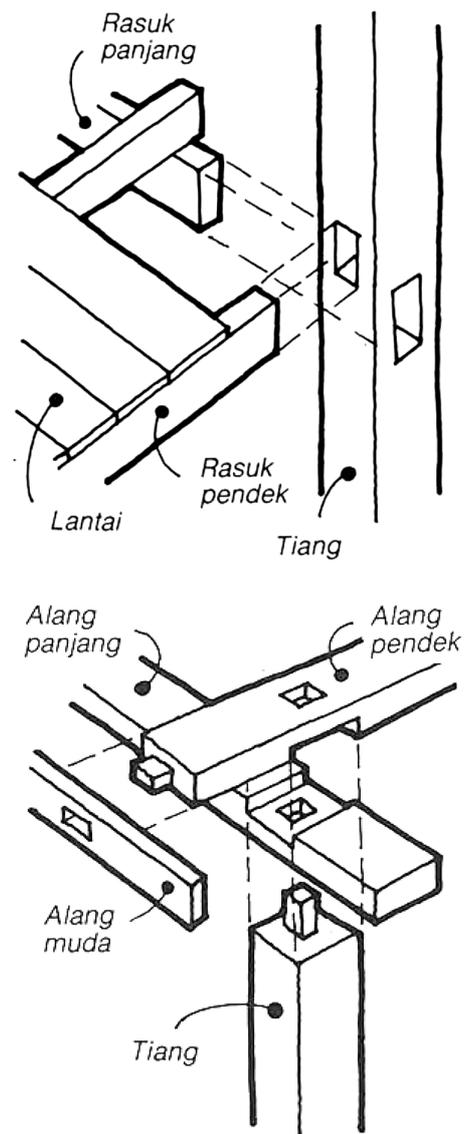


Figure 1.5 Example of a tanggam connection on the timber pillars. Source: Lim, 1987, p.104.

1.2 Description of a Malay house

This section explains in general the traditional Malay house; describing the roles played by a *tukang* and other participants involved. It provides an overview of the knowledge and skills required for the Malay *tukang* in order to complete a Malay house construction. In addition, the literature review of the building process will be a key reference for the fieldworks, described in Chapter Two.



Figure 1.6 Example of a traditional Malay house in Terengganu with a regional variation of form and style said to be influenced by Thai architecture. This structure was disassembled, reconstructed and restored as a resort building in Terrapuri heritage village. Source: Author, 2016

The concept and development of building the traditional Malay house includes activities relating to spiritual, rituals and customs, the selection of wood, the fabrication of components, the procedural construction strategy, measurement systems, creative thoughts for the detailed carvings, designing of spatial spaces and hierarchy, assembly and disassembly, transportation of the houses and more. This involves certain individuals and groups that contributed to the whole process of

the construction from start to finish. In addition, the focus of the study not only involves documenting practical processes but also includes the intellectual and reasoning aspects of Malay house-building and tukang's workmanship.

The study begins with the description of traditional Malay house building process, emphasising the knowledge and dexterity of the Malay craftsmen. In order to understand the subject in detail, the type of a traditional Malay house had to be defined in terms of the context of its place, time and form. Little is known about when the traditional Malay houses were first built although the Malays are believed to have existed as a society thousands of years ago, and thus are the indigenous population of the Malay archipelagos.⁹

For the purpose of this study, the term 'traditional' refers to the period of time after the Malays had embraced Islam¹⁰ as the majority of literature relating to the study contains Islamic elements in the cultural and practical aspect of the building process. The dominant 'traditional' feature of the Malay house worthy of consideration to the study is in the use of *tanggam*¹¹ connection system or wooden pegs that avoids nails or steel connectors. Therefore, the timescale in the definition of a Malay house is identified to span between the adaptation of the Islamic faith by the Malays and before the introduction of the nail or steel connection system.

The study intend to focus on the *bumbung panjang* house form within the Malay traditional house typology, described by Lim (1987) 'as the oldest identified in Peninsular Malaysia', 'many of them (..) still in good condition', 'commonly found', 'most traditional and the commonest' and 'highly developed, with a sophisticated building and addition system',

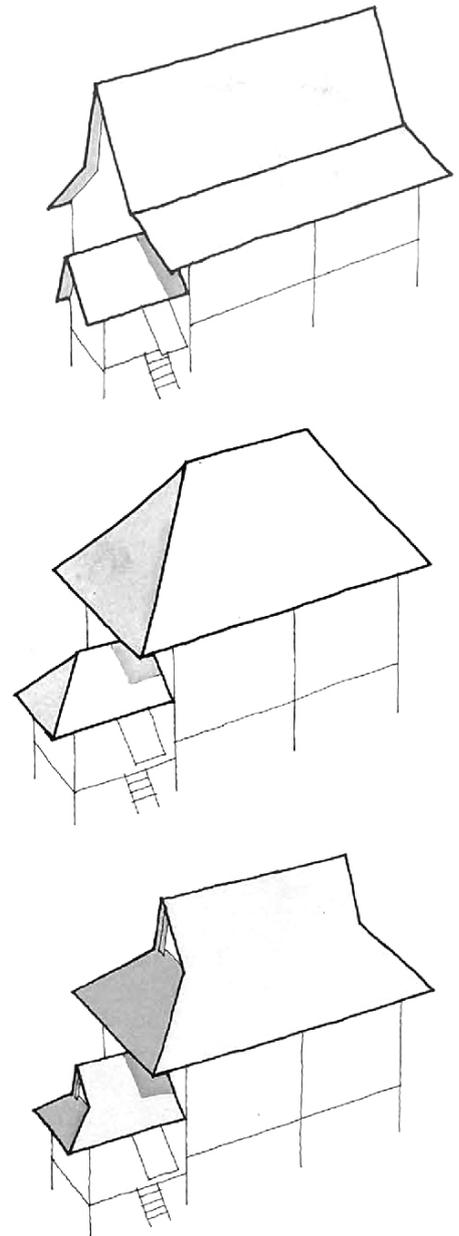


Figure 1.7 Type of a Malay house based on the roof. From top: Bumbung Panjang, Bumbung Lima and Bumbung Perak. Source, Lim, 1987, p.22-25.

⁹ The archipelago refers to the area between mainland Southeast Asia and Australia, inhabited by the Malay race and what are now the Philippines, Singapore, Malaysia and Brunei. The statement is proven by the findings of human skeletons dated 11,000 BC at Gua Gunung Runtuh, Lenggong in the state of Perak in Malaysia (Soh and Omar, 2012, pp. 602–603).

¹⁰ The main evidence existing to portray that part of the Peninsula Malaysia had adopted the Islamic faith is written on the Terengganu Inscription Stone written in Malay language with Arabic letters (*jawi*) believed to be dated 22nd February 1303.

¹¹ A connection system in timber detailing without the use of nails or steel connectors. Refer section 1.1 (vii) on explanation of *tanggam*.

which was accepted by many. The traditional Malay house varies regionally in terms of its roof form such as the *bumbung limas* and *bumbung perak*, developed and influenced by colonial Dutch and British. Meanwhile the *Minangkabau* roof form is prominent in the state of Negeri Sembilan as well as the influences of Thai, Laotian and Kampuchean or Patani elements which were common in traditional houses of the East coast of Peninsular Malaysia (Sheppard, 1969). It is also important to understand that East Malaysia, or also known as Borneo has a traditional house form of its own called the 'long house'. It is not within the scope of the study although some of the residents of long houses had split into separate dwellings due to the 'Malayanization' influence (Waterson, 1997).

The problem with focusing on the *bumbung panjang* house form, which is normally found in the north west of Peninsular Malaysia, is that traditional craftsmen and the traditional production of Malay houses in existence today are usually based on the east coast where the traditional Malay house there has influences from *Patani* mentioned earlier. Nonetheless, the study anticipates a common and general practice in the process of building the traditional Malay house as broadly documented and accepted by the Malays as well as researcher of the standard norms (Abdul Rahman, 1999, p. 7).

Furthermore, although the variation existed regionally due to outside influences, Hilton (1992, p. 57) confirms to the unity of house type built by Malays throughout the Peninsula and states that they were only different in styles, thus the definition, characteristic and built procedure of the traditional Malay architecture in this study will be generalized as the traditional Malay house.

Generalising the traditional Malay house in terms of the building processes serves to focus towards the workmanship of traditional Malay *tukang* rather than the affect of influences on styles or its form. As the practice and skills of building the traditional Malay houses were 'handed down from generation to generation and a tradition of building strongly established' (Lim, 1987, p. 101), the customs may have not changed drastically from the early Malay settlements in the Peninsula. By using interviews as part of the research process, the study attempts to acquire an overview of the individual competency of Malay *tukang* in their building experience and procedures with reference to traditional

practices mentioned in literature. The study will question what goes through the mind of the Malay *tukang*, his thoughts, dexterity and role in relation to his built masterpiece and other building participants.

The study attempts to examine the phenomenon in contemporary Malay building practice with emphasis in analysing the skills and customs of Malay *tukang* from the perspective of the traditional context and within contemporary practices. From the fieldwork, it is anticipated that the study will uncover the qualities and skills of Malay *tukang* in their practices with reference to the traditional belief system, use of tools and the current construction requirement.

1.3 Research context

The context or background of this study was based on the premise that the traditional Malay house lies not only on the physical but rather an integration of multiple elements, including the practice and rituals which are often left out. As Carsten and Hugh-Jones (1995) argue: 'Houses are taken for granted' by researchers as the houses, 'soon fade into the background to become merely the context and environment for (..) ethnographic research'. Research on Malay houses was commonly disengaged from its architectural features (materials, spatial, symbolism, aesthetics) or in relation to this study, the social practice of the people who build them. Although the current study of traditional Malay houses mainly reflects upon its characteristics and symbolisms, nonetheless, 'It is only under exceptional circumstances – house-moving, wars, fires, family rows, lost jobs or no money – that we are forcibly reminded of the house's central role and fundamental significances' (Carsten and Hugh-Jones, 1995, pp. 4).

In this case, traditional Malay houses are on the verge of disappearing (and also rarely built) and this is therefore, currently a subject of interest to this study and others; from governments, institutions and individuals alike to safeguard their existence. Subsequently, the idea of a house in its physical form is inseparable from its context: people, rituals and site, and thus scrutinised. In the same way, a Malay house is inseparable from a *tukang*, building practice and rituals, *kampung* setting, and the Malay culture.

1.3.1 Thesis questions and aims

Generally, the study investigates the notion of Malay craftsmanship in contemporary building culture with regards to the Malay house as an artefact as well as a building process. There are three core objectives and various research questions considered as part of the study described as follows:

1. To understand the craftsmanship in the Malay house-building culture within past, present and future. The matters of possible enquiry are identified within the notion of crafts, craftsmanship, physical object or artefacts and tangible or intangible cultural heritage.

Research Questions:

- i. What is the definition of craftsmanship in the Malay world, specifically pertaining to their traditional house-building culture? What are the primary features, qualities and values of Malay craftsmanship? How is it distinctive from other crafts throughout the world?
- ii. Who were the participants in the building process and what were their attributes, skills, proficiency, qualities and mandatory contributions?

“What are the values and mechanisms of transmission of knowledge and skills that has allowed the building tradition to continue in the context of modernity and globalisation?”

2. To identify the legacy of past Malay house-building culture at present and how it was transmitted, interpreted or acknowledged within contemporary building culture in Malaysia.

Research Questions:

- i. What is the legacy of Malay house-building culture and what has remained, been lost or reinterpreted.
- ii. How knowledge and skills were expressed or understood within the building culture and how the building participants embrace them.
- iii. What are the values and mechanisms of transmission of knowledge and skills that has allowed the building tradition to continue in the context of modernity and globalisation?

3. To explore and understand contemporary phenomenon in the building culture of traditional Malay houses.

Research Questions:

- i. What are the roles of building participants and the existing or newly-built traditional Malay house?
- ii. What are the motivations and approaches to the continuation of Malay building legacy in a context where modern building techniques dominate?
- i. What are the possibilities of traditional craftsmanship in Malay building culture for contemporary and future built architecture?

1.3.2 Methodology

The qualitative methodology used in the research is justified to fully explore all aspects of the research questions. It includes the sequence of the Malay building culture from fabrication of building component to assembly, from both traditional and contemporary point of view; with an emphasis on *tukang's* practice and mastery. In contrast to the research conducted by Ariffin (2001) entitled: 'Order in Traditional Malay House Form', the study seeks to examine the wisdom of a *tukang*, both from a conceptual and technical standpoint. Rather than examining the artefact of a Malay house alone, the study investigates *tukang's* practices and beliefs portrayed in their workmanship of Malay building culture.

The methodological framework used in the study is adopted from Franz's description of conceptual and technical-oriented research (1994). The 'conceptual' is expressed as a psychological frame-of-reference; a process that draws on past design experience, utilising rational and creative reasoning, while 'technically-oriented' describes a 'systematic frame-of-reference'. Both frames of research described emphasise on creativity and productivity to achieve a hermeneutic approach in the interpretation and meaning of ideas found within the Malay building culture.

"...the study seeks to examine the wisdom of a tukang, both from a conceptual and technical standpoint."

The study adopts the explanatory method to develop a, 'nuanced view of reality' of contemporary Malay building culture, focusing on the 'general and context-independent theory' of social science research

(Flyvbjerg, 2006). Observational method was used to gather data from fieldwork as it provides the opportunity for the author to experience first hand the consciousness and tacitly of the subject. Initially, the study makes use of visual research materials in the form of images, however it is recognised that this is not entirely, 'objective visual records' but rather subjective in meaning according to the interpretations of viewers and research subjects (Pink and Seale, 2004). The *tukang* and other personnel introduced in section 3.2.5 are investigated to achieve a thorough understanding of the study and at the same time provide primary source material.



Figure 1.8 Author with the family at Terrapuri heritage village during the fieldworks conducted in Malaysia. Source: Author, 2016.

Observation would not be useful without interview sessions with particular individuals, hence the study employs an unstructured interview approach with a combination of closed and open-ended questions, to give interviewees the flexibility to express their own thoughts in regards to the subjective matter of craftsmanship and the process of 'making'. The selection of interviewees was based on the knowledge of *tukang*, practitioners and academics in regard to the subject matter, including anecdotal and oral history, although it has not always been possible to verify these records. Oral history instigates a multidisciplinary approach, enriching interpretations of the past and present while acknowledging the situated subjectivity within social science research (Bornat, 2004).

1.3.3 Ethics Application

In order to conduct the interviews, the research received ethics approval from the Ethics Committee of The University of Sheffield in 2014. Permission has been sought to identify interviewees. Confirmed potential participants were initially contacted through email or telephone. In addition, the study conducted ad-hoc interviews as necessary. All participants were provided with a participant information sheet and consent form (English or translated version in Malay) for arrangements of interview sessions. Participants were asked to read the participant information sheet and to sign the consent form prior to the interviews.

The interview sessions were recorded, transcribed and later translated into English if necessary. This information was stored electronically on

an encrypted computer. Physical copies were stored in a secured locker at the University where only the author and the supervisors have access.

1.4 Significance of the study

1.4.1 Contribution to knowledge

The initial contribution of the study is the definition of the characteristics and qualities of Malay craftsmanship (or the likes of it) in the traditional Malay house-building, contextualising the historical readings described in the literature review. Although the notion of craftsmanship is extensively discussed in the West and does not directly translate into a Malay context, it provides an established framework of reference for the study to draw an analogy between the West and the traditional Malay philosophy.

In addition to this analogy is another layer of facts concerning the perception of the people, particularly the modern *tukang* who are still building traditional Malay architecture. These *tukang* continue to build traditional Malay houses, although adopting modern tools and equipment, to practise past Malay building culture. The resources from these individuals resulted in the reasoning and justification as to the extent of past legacies such as in the knowledge and skills, being transmitted and applied by contemporary *tukang*. That being said, the study contributes to the argument whether past inheritance in the heritage sense is applicable or even relevant to the practice of current *tukang* due to the integration of traditional techniques with modern working practices, including repair and preservation of Malay structures.

Finally, the study aims to supply the understanding of the Malay building culture as a process of cognitive practice, leading to the rediscovery and reproduction of past knowledge and skills. Therefore, the study aspires to record, understand and transcribe holistically the building culture including the ritual and technical process of building Malay houses. More importantly is to speculate the roles of contemporary *tukang* and the function of the traditional house rather than merely an identity tradition and heritage practice or artefact. Eventually, the study hopes to promote additional arguments in existing studies and to lay the groundwork for undertaking supporting the transmission of tangible and

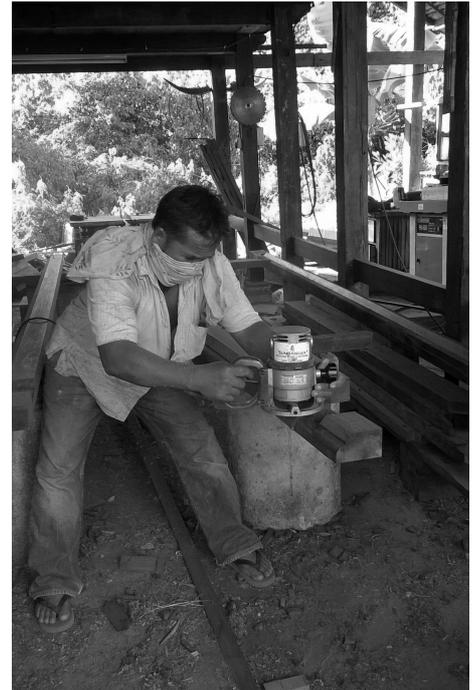


Figure 1.9 *Tukang* using modern hand tools to shape the 'bendul' building components, which in the past had employed manual traditional hand tools. Source: Author.

intangible qualities of one of the indigenous heritages in the Malay built environment.

1.4.2 Intent of the study

The contemporary Malaysian architectural scene is diverse, messy and lacking in regional identity (Yeang, 1978). The search for a Malaysian architectural identity, previously discussed and debated among architects and professionals alike, has been unsuccessful. There is a lack of enthusiasm in the architectural scene; either from architects, clients, architectural students or the public, for pursuing an agenda promoting regional characteristics in the building industry. Abdul Rahman (1999, p. 2) believes that this, 'sad state of affairs is due to a lack of understanding of the heritage and the roots of architecture,' within the Malay architectural worldview, hence the study on the past success within the Malaysian architectural scene is worth pursuing. For that reason, the study of traditional Malay houses and the building culture is valuable as it is considered as a successful architectural representation in Malaysia. It is a common structure built by the Malays and displays indigenous procedural and cultural techniques of building.

Though competing traditions represent a significant influence on architecture in Malaysia, other factors within contemporary life should also be taken into consideration. This includes the transformation of culture, and changes in practices, techniques and technology in the Malaysian building industry. In addition, it is also wise to reflect on the future representation of Malaysian architecture, and speculate and envisage a model that is plausible to adapt.

This study ventures to explore qualities in the traditional and current practices of a Malay building process in order to understand the values that lie behind conceptual, technical and manual building practice. It aims to seek a mutual principle between traditional values and their development, for the qualities to be continued and adopted into the future. Instead of investigating the physical characteristics of the Malay house form and functions in isolation, the study focuses on the knowledge and skills of the participants who practise the Malay building tradition, mainly the Malay *tukang*. This is done by understanding the development of Malay *tukang* by exploring their thoughts and ideology in the making process of fabricating and assembling the traditional

Malay house. It examines the process of traditional Malay house-building in order to understand *tukang* values, habits, qualities, relationship with other individuals involved, and tasks or procedural techniques required.

It is important to describe in detail the traditional Malay house-building procedures to explain interrelated means of 'making' with aspects of building technical know-how and indigenous belief within Malay culture. Similar to the making of traditional Malay handicrafts and weaponry, the process of building a Malay house dwells deep within the customs, practices and religious doctrines that incorporate spiritual and physical aspects of material, form and actions.



Figure 1.10 The current housing in Malaysia where terraced houses made from bricks are dominant. Source: Izura Tukiman.

Currently, the practice of building the traditional Malay house is in danger, as the Malaysian community prefers masonry-built houses that dominate the construction industry due to status, costs and trend. Likewise, few people adapt the concept of the traditional house as part of the construction identity in preference to western-built techniques. However, the traditional Malay house design is successful in the tourist economy, demonstrated by the trade of handicrafts, miniature models, chalets and high-end hotels that are an artificial adaptation of the architectural values of the unique Malay design. While traditional practice is slowly disappearing, the intention of this study is to promote continuity of the traditions, values and principles of traditional Malay craftsmen that are decreasing in Malaysia. This is achieved by recording

studied the understanding of magic measurements¹² with regards to the traditional and mythical artifacts and in addition, contributed towards the study of typological rule system (Chen et al., 2008). The areas of sustainability were also discussed (Amat and Rashid, 2009; Bakar et al., 2010; Enoch and Shuaib, 2013; Raduwana et al., 2012; Ramli, n.d.), including the discussions on conservational studies conducted towards traditional building in Malaysia (Harun, 2011; Mohamad Rasdi et al., 2005; Zuraidi et al., 2011).

Meanwhile, the understanding of wood carving, as part of the traditional craftsmen's indigenous skills are explained thoroughly (Housseini et al., 2012; Said, 2002; Said and Kamarudin, 2008; Silah et al., 2012), as well as a record of the construction process and skills required in contemporary production of timber Malay architecture (Desa and Syed Ariffin, 2008). The comparison in construction aspect of the traditional Malay house in reference to modern architecture was analysed (Ju et al., 2012; Omar et al., 2012; Rahman et al., 2006; Utaberta and Spalie, 2011) and an attempt to trace the development of the building industry in Malaysia was made by Gullick (2012) in his paper entitled 'The Builders'.

The values of traditional Malay houses as a potential influence in innovating contemporary houses was demonstrated (Hosseini et al., 2012). In regards to the area of digital culture - although irrelevant to this study - Said (2007) and Embi (2007) relate the modularity concept embedded within the traditional Malay house with digital grammar. This is to identify the evolution of the 'long roof type' Malay house, which is effective in digital form finding.

However, little has been explored in the analytical understanding towards the attributes of a Malay *tukang* in reference to his ability, habits, creativity and belief system in building the traditional Malay house. These include the sensual experience and intellectual thinking of *tukang*, which has yet to be explored in this area of study. In addition, the evolution and role of Malay *tukang* as well as the relationship with other characters involved in the building process is also less portrayed in previous literatures. Both areas of the study on other aspects of the traditional Malay house are crucial to evaluate the values of traditional Malay workmanship.

¹² Refers to a kind of action initiated charm applied by *tukang* to a peculiar technique of measuring (Ariffin, 2000, p. 95)

Only one known attempt was made to emphasize the role of Malay *tukang* in regards to the traditional Malay architecture worldview by Abdul Rahman (1999). He reviewed the concept of traditional architecture with the Malay worldview through a collective spirit of the Malay society and the individuality. His understanding on the attributes of Malay *tukang* is for them to possess different roles (ie as a *tukang*, *pawang*, *ketua adat* and a carver) within the society specifically in the process of building a Malay house. He further concluded that the individual Malay architecture worldview contributed to the innovative spirit and the sense of novelty of a Malay house; a significant role in giving in 'beauty and completeness (..) within the context of his [*tukang*] culture'. Abdul Rahman (1999) seeks to present a theoretical base of understanding a regional identity that is lacking in the Malaysian contemporary architectural scene.

The brief description of the roles and attributes of Malay *tukang* within the Malay architectural world view by Rahman (*figure 2.9*) establishes a starting point in this study to pursue further understanding and the specificity of *tukang's* characteristics and qualities. Part of the study activity is to identify the craftsmanship in Malay house-building qualities that had been neglected, elements that are still maintained in practice and others that had been adjusted to adapt with the contemporary building. This is achieved by understanding the culture, principle, creativity, knowledge and skills within the traditional building process in the past as well as in the present.

1.5 Structure of thesis

The thesis is divided into six chapters where as presented earlier, Chapter One provides an overview in the context and intent of the study within the research area of traditional Malay houses. The study emphasises in the practice of *tukang* in the Malay house building culture and their related attributes pertaining to the reproduction of knowledge and skills in contemporary building. Therefore the study is not only limited within the cultural heritage domain, rather embracing the aspect of practice and learning.

In Chapter Two, the study examines existing literatures that provide evidences to explain the culture, rituals, past knowledge, production and

dexterity associated with Malay house building culture. Furthermore, Chapter Two introduces the physical characteristics of these Malay houses - considered as a building craft due to the expressive building process and techniques - with relation to cultural values, which is equally important as in any other Asian cultural heritage. In the same way, the justification of tangible and intangible in the Malay cultural heritage and the aspect of apprenticeships as a traditional method of transmission establish the study within a broad framework of world heritage.

The attributes of past *tukang* are narrated in relation to their practice and hypothetical conceptions of what an ideal *tukang* possesses in terms of knowledge and ability or the roles and responsibility of *tukang* depicted in existing studies, were explained briefly. Though mostly derived from Western sources, the literatures then investigate the notion pertaining to the Malay building culture in order to identify description in the dissemination of knowledge and skills or the preservation of it.

Chapter Three introduces the methodology used throughout the study, which stresses on the empirical and qualitative research methods adopted. Approach in the observations and unstructured and open-ended interview techniques were necessary in the fieldwork conducted in Malaysia. Data were gathered from various subjects that include *tukang*, experts and non-experts. The general account in the historical background of these subjects, in particular the *tukang*, were presented to provide the context in relevance of each subject towards the contribution of the study. Furthermore, Chapter Three explains the understanding of how empirical data were captured, analysed and understood. Similarly, this chapter explains the ways fieldwork data as in the interviews were organized and transcribed.

Consequent chapters provide a wealth of information on the traditional building culture that is reflected upon the thoughts and opinions of the subjects, mainly from interviews and observations conducted on sites of traditional building process. The chapter categorised the fieldwork data thematically, where a significant part is attributed to practice of *tukang*, the building process, notably in the disassembly and assembly procedures. There was a great potential in this area of research as the phenomenon of *tukangs'* development in their trade was discovered to

“...the study claims that the process of disassembly and assembly acts as a catalyst the for transmission of traditional knowledge and skill, akin to the model of

be influenced by the disassembly and assembly, as a result of their physical and non-physical involvement.

The main arguments of the study are then presented in Chapter Five where the study claims that the process of disassembly and assembly acts as a catalyst the for transmission of traditional knowledge and skill, akin to the model of apprentice-style of learning. Hypothetically this is possible due to the decline of ‘masters’ in this traditional building trade at present and the nature of disassembly and assembly process acting as a knowledge exploration tool and discovery. The study highlights the relevance of disassembly and assembly procedure as a communicative act in portraying the transmission of tangible and intangible through the physical and spiritual interaction with heritage artefacts such as a Malay house.

Finally, the conclusion section of Chapter Six reflects upon the Malay house not only as a cultural artefact in its entirety, rather a resource of knowledge, techniques, and stimulations that is dominantly proceeded upon the meaning and progress of *tukang* themselves. The disassembly and assembly renders the Malay house as a ‘reflective artefact’ in which the apprenticeship-style of learning could persist in the activity of conservation and preservation projects of existing traditional Malay houses. This further manifests the importance of architectural artefacts as well as the re-enactment of practice and rituals already embodied within the Malay house-building culture.

1.6 Conclusion

The initial background of the study reflects upon the national identity crisis in architecture and issues pertaining to Malaysian cultural heritage such as the traditional Malay houses. As a representative of vernacular Malaysian architecture, the traditional Malay houses were identified as exemplary towards local architectural identity, particularly in the reproduction of visual and physical characters in modern buildings. Although most of these reproductions failed in their physical adaptation within contemporary buildings, the concept in the revival and literal imitation of form derived from traditional Malay houses remains acceptable among few local architects and largely among the public masses. In contrast, the study attempts to examine the instance in the study of traditional Malay houses as a progressive approach,

investigating the conception derived from the essence in the meaning and approach in the tangible and intangible values.

A similar approach was made by Ariffin (2001) to inspect the representations in the built form of Malay houses as the principal ideology and criteria for vernacular Malay architecture. The study by Ariffin is almost technical, which could also inspire other research such as in examining the futuristic design development of Malay house types using contemporary digital tools (Said and Embi, 2007). On the other hand, this study presents itself largely within the context of the physical and spiritual practice in Malay house building culture and the people involved. The thoughts and the actions of contemporary Malay *tukang* were contemplated to draw an analogy with the historical readings in existing literatures.

The objective of the study is to enquire the expression of craftsmanship in the Malay house-building culture, the transmission of skills and knowledge and the prospects of a traditional building culture to assimilate within contemporary practice. Possible inquiries correlates with the notion of craftsmanship, existing artefacts, and theories of tangible and intangible cultural heritage. The study highlights the existing building methods of disassembly and assembly as a crucial procedure in the continuation of the traditional legacies. Fieldworks were conducted in Malaysia in order to achieve the objections and to answer the research questions that requires methods in observations and interviews of relevant research subjects, mainly the Malay *tukang*.

Examining traditional Malay house-building culture at present is to inquire on the legacies of past Malay craftsmanship within contemporary practice, currently in the form of building conservation. The study intends to highlight the legacies narrating the aspect of skills and knowledge transmission, interpretation or acknowledgements. However, it is essential that inquiries if the study corresponds to the Malay *tukang* or the building practitioners, rather than relying completely on the judgments of experts or academics. Eventually, the study seeks to rationalise the phenomenon within contemporary Malay house-building culture in order to preserve and develop the traditional knowledge and skills. This phenomenon is derived from the embodiment of the Malay house characteristics: disassembly and assembly.

The following chapter presents an overview of the topic from existing literature on Malay craftsmanship and the traditional building practice. Chapter Two introduces the themes pertaining to the vernacular architecture and its building participants, the Malay culture, rituals, past knowledge, production and skills associated with building Malay houses. The chapter is concluded with examples of existing heritage actions that could be learnt and adopted within the preservation strategy.



Figure 1.12 Heritage house of Haji Kundur conservation project located and conserved at the Politeknik Port Dickson, Negeri Sembilan. Source: Author, 2015

Chapter Two.

Building the Malay House: Literature Review

2.0 Introduction

'Vernacular defined by social status – not only of buildings, but builders.' - Mauldin, 2010

The study of the traditional Malay house engages with multiple disciplines cutting across architecture, history and culture. This study focuses on the Malay house and its building process in reference to theories of vernacular architecture that are dynamic and sophisticated, emphasising the inseparability of the physical and immaterial characteristics. This builds on Blundell Jones' description of vernacular architecture:

'It is both pessimistic and patronising to dismiss vernacular building as unsophisticated, purely practical, and imprisoned in the cage of a static craft tradition'
- Peter Blundell Jones, 2016

However, in order to understand the process of building this heritage artefact, it is necessary to understand social practices and rituals, religion and beliefs, and associated techniques in the Malay culture. Therefore, in this chapter the study introduces the traditional Malay house and the building culture as the primary subject of review which is situated within the study of vernacular architecture. The general characteristics description of Malay houses are explained as well as its poetics to elaborate an alternative view of the Malay house, which previous studies had primarily explored in technical and formal terms. This is based on the premise that the Malay house is best understood in terms of craft and its intangible qualities, specifically the Malay building craft, rather than in purely technical terms or as only a response to the requirement for dwelling or shelter. The study further champions the outlook of traditional Malay building culture as 'defined by [its] social status - not only of buildings, but builders' (Maudlin, 2010).

To establish this, a review of literature on the Malay craftsman or *tukang* indicates the attributes generally required of him to consider himself as a master. This includes the values, skills, knowledge and social structure in the system of apprenticeships. The study will consider the concepts of craftsmanship and workmanship in a Malay context to develop an understanding of how a Malay *tukang* relates to notions of craftsmanship within southeast Asia and a wider body of knowledge. The result of this could be compared with findings during fieldwork in response to the vernacular, tradition and contemporary features.

The study introduces other theoretical concepts such as practice theory, phenomenology and apprenticeship-style of learning. In the same way, the process depicts a unique and distinct concept of a house, the building process and its associations within culture that should be made exemplary within the Malaysia housing archetype. Nevertheless, this study avoids a romantic view of tradition, instead clarifying the potential role of social performance, actions and procedures (ritual or technical) in the continuation of indigenous knowledge for future development. To look at the topic of skills and knowledge transmission is to question how knowledge is created or reproduced within the building culture, hence the study investigates the general approach to knowledge transfer and possibly within the procedure of building the traditional Malay house.

Eventually, in the contemporary context where preservation and conservation of Malay houses is advocated by many, the literature looks toward the organizations that are responsible in their preservation - many of which have differing attitudes towards conserving cultural heritage to provide insights into how a Malay house could be revived, not just physically but in the manner of expressing meanings, symbols, memory and collective motions.

There have been developments in the scholarship of the Malay house looking at different aspects of traditional Malay anthropology in regards to the Malay societies, their activities, beliefs, technical ability and description of the indigenous dwellings, shelter and *kampung* (refer section 1.5.1). The study, however, attempts to focus on the social aspects of Malay house-building and how skills and knowledge transmission occurs among Malay *tukang*, apprentices or labourers and the community as a whole.

2.1 Vernacular architecture

Vernacular architecture in its broadest meaning is the architecture ‘concerned with domestic and functional rather than public or monumental buildings’ (Oxford Dictionary). The term vernacular is adopted by professionals¹³ and academics (Brunskill, 1971; Maudlin, 2010; Oliver, 1997; Rapoport, 1969) to describe dwellings or shelters known to be built by the owner and their community, avoiding the restrictions of erudite interpretations of architecture¹⁴ (Leal et al., 2013) as the building process consumes empirical knowledge passed on from one generation to the other. It is also repeatedly defined as ‘architecture without architects’ (Rudofsky, 1987), popular, communal or folk architecture. Veira de Almeida outlines other keywords pertaining to vernacular in architecture as ‘a holder of an expression stratified over time, of regional nature, spontaneous, popular, genuine, meaning culturally candid, [and] not dominated by scholarly ideas,’ (Almeida, 2013 [2011], quoted in Leal et al, 2013).



Figure 2.1 The Malaysian Vernacular architecture is typically associated with the raised building, timber panelled walls and a pitch roof.

Sometimes it can be difficult to distinguish ‘vernacular’ from ‘traditional’ where traditional is described to be defined by space and time of the

¹³ ICOMOS: Charter on the built vernacular heritage, ICOMOS, Mexico 1999.

¹⁴ This is, “the notion of ‘vernacular’ supposes a reality where expressive maturation was not deviated by any excess of information” (Almeida, 2010: 12, quoted in Leal et. al., 2013). In short, it requires less structured knowledge as what is needed in designing and building contemporary architecture.

past (Ariffin, 2001), in contrast, the vernacular is concerned with the idea of specificity to place. Additionally Brunskill (1971) in his *Illustrated handbook of vernacular architecture* distinguished the 'vernacular' from 'polite architecture'. While the latter is designed to 'follow a national or even an international fashion, style or set of conventions (..) [where] aesthetic considerations dominated (..) rather than functional demands,' the former is 'guided by a series of conventions built up in his locality' (Brunskill, 1971). Therefore vernacular to a greater extent contributes towards the 'spirit of the place'.

Vernacular architecture is often seen as an expression of physical characteristics (form, structures and materials) in response to the specifics of place and its people (Maudlin, 2009). Physical evidence of traditional architecture from records and documentation (ie. fieldwork) provides the means for research and interpretation of vernacular studies. This is prevalent in current studies of traditional Malay houses, building on Rudofsky's (1987) cataloguing work of vernacular houses which was merely descriptive and functional with inclination towards the form, economy, materials and structures. The value of traditional architecture seems to be a portrayal in the image of 'form follows function' (ie. plan, form, materials and structure) rather than its rich cultural inclinations and contexts (Cooper, 2002 p. 29).¹⁵

However, vernacular architecture studies have evolved over the years from folk studies to 'the field of ethnography, cultural geography and material culture,' where vernacular architecture is interpreted as 'artefacts of human culture' (Maudlin, 2010). Paul Oliver and Amos Rapoport pioneered the notion that the vernacular, particularly traditional buildings, are understood as a study of cultural impetus (Oliver, 1997; Rapoport, 1969). That being said, the study of vernacular architecture is relevant within socio rituals and cultural practices, where human values are the main proponent to the formation of vernacular buildings.

Consequently, describing the term vernacular itself centres on the 'language or dialect spoken by the ordinary people of a country or region' (Oxford Dictionary), or people engaging in a specialised activity. Hence, a vernacular architecture could be seen as the 'architectural

¹⁵ See also Pavlides, "Four Approaches to Regionalism in Architecture," p.164.

language of the people' (Brunskill, 1971) where 'people (the users, occupiers and dwellers) [are established] as its field of study' (Maudlin, 2010, p. 11)¹⁶. This suggests that the consideration of vernacular architecture should not be limited towards the physical architecture itself. On the contrary, it should explore the notion of immaterial concepts related to people – culture, spiritual beliefs and practices are taken into consideration rather than considered in isolation.

Inevitably, the notion of 'place' or region is undeniably important in vernacular architecture as people are contained within their geographical boundaries, although the Malays could also be defined within lingual limits¹⁷. Nonetheless, the primacy of place was observed by Nezar AlSayyad (AlSayyad, 2004) where, 'for anything to be considered vernacular, it has always been assumed that it must be native or unique to a specific place.' A place or region not only constitute the cultural temperament of its people, but the climatic and natural environments it surrounds (Ahmad, 2007). Similarly, Alves (2017) suggested the *genius loci* or the immaterial characteristics of a place: history, identity, meaning, and climate should remain pertinent when discussing the topic of vernacular architecture. Norberg-Schulz summarises the notion of *genius loci*;

"Independent being has its genius, its guardian spirit, which gives life to people and places, and determines its character and essence." (Norberg-Schulz, 1997).

This definition involves what Maudlin (2010) called a 'post-romantic study of folk architecture'¹⁸, which points to the notion of 'place and ethnicity' within an established locality, regardless if it fits the rural or peasant architectural connotations. It is part of the values central to vernacular architecture, which is not only a 'technical or aesthetic

¹⁶ Maudlin (2010) notes that 'the etymological (origin) root of the word vernacular comes from the Latin *verna* or slave.'

¹⁷ Alatas (1977) notes that although the Malays were sea-voyagers and traders who traversed the world, they could also be defined within both the language and the region. Nonetheless, the Malays are from the Austronesian language family where the language is from a single origin.

¹⁸ Folk architecture is rooted in the study of folk architecture which 'represents an attempt to preserve a regional essence that is keen to be in mortal danger and [its aim is] to uphold the qualities of Kultur against the incursions of a universalizing and rationalising Civilization (Colquhoun,

exercise' but 'inextricably linked to the same social and environmental processes' (ibid, 2010). A process that seeks to explore the building culture such as the traditional Malay house from the prospects in the 'persistence of memory within craft training, (...) dissemination of skills, labour, tools, materials and components' as wholistically (Maudlin, 2010 p.12).

Maudlin (2009, p.47) further explains this conception of vernacular:

'Our understanding of the vernacular and the meaning of tradition has developed in recent years to include the importance of everyday human activity, quotidian social ritual, in the production of traditional forms and spaces. This shift in thinking about the production of traditional buildings is informed by notions of dwelling (post-Heidegger) and cultural production (post-Bourdieu) and their impact upon architectural and cultural theory.'

While the emphasis of vernacular architecture lies in the physical dwelling or shelter, and encompasses its *genius loci*, from the perspective of behaviour studies it is a 'systems of settings'. The system of activities and results of human actions on the cultural landscape are considered (Rapoport, 1999). It arises out of the choice of the people and their actions, rather than simply what has been constrained upon them from external influences – it 'cannot be seen as a simple answer out of sheer necessity, adapted to the conditions of each site (locality and requirements of a place). The vernacular also implies cultural choices, even though they do not address to a predetermined cultural aim' (Almeida, 2010: 12, quoted in Leat et al., 2013).

Furthermore, notions in which vernacular architecture is understood in context (its architectural character and essence) can be viewed from the '*vernacular way of thinking*' (Alves, 2017). This introduces and conceptualises key strategies in the thinking of dwelling or shelters based on the definition that encompasses vernacular architecture in relation to the solidity (*firmitas*), function (*utilitas*) and beauty (*venustas*), conforming to the propriety (*bienséance*) of the people concerned (refer fig. 2.1). This seminal definition is appropriated from

Vitruvius (1st Century BC), Marc-Antoine Laugier (18th Century) and Pedro Vieira de Almeida (20th-21st Century).¹⁹

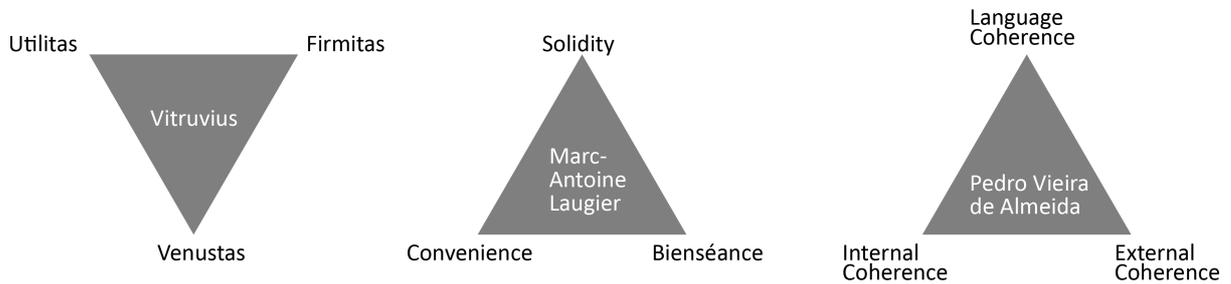


Figure 2.2 Architectural Conceptual Models based on Vitruvius, Marc-Antoine Laugier and Pedro Vieira de Almeida, Source: (Alves, 2017)

Hence, to understand the ‘vernacular way of thinking’ is to acknowledge that physical form is not isolated from other parts, and that vernacular buildings continue to evolve while retaining contemporary relevance, contributing towards the spirit of a place. Vellinga (2006) highlights that changes in vernacular architecture (often perceived as representing a loss of identity and cultural decline), are more than ever, appropriate. The amalgamations or evolution of ‘traditional’ to ‘modern’ architecture is currently changing and constantly transforming, which defines the dynamic nature of vernacular architecture, while contradicting the common traditional backwardness it is associated with (Vellinga, 2006).

Vernacular architecture gives us a sense of continuity in time, thus ‘it is both pessimistic and patronising to dismiss vernacular building as unsophisticated, purely practical, and imprisoned in the cage of a static craft tradition,’ (Jones and Kong, 2016). Therefore, a categorisation of vernacular buildings should be viewed broadly, to include any ‘distinctive cultural expressions of people who live in or feel attached to a particular place or locality’ (Vellinga, 2006).

¹⁹ Alves (2017, p.188) described these seminal thinking: ‘Vitruvius (1st century BC) stated that “In all construction should be taken into account its solidity (*firmitas*), its utility (*utilitas*) and its beauty (*venustas*)”. Marc-Antoine Laugier (18th century) also established several reflections about architecture: “one must build with solidity, for convenience and according to *bienséance* (propriety – conformity to conventional)”. Pedro Vieira de Almeida (20th-21st century) defines three main poles that interact in the design process. (...) *Internal Coherence*, comprises the program formulation, the function. (...) *External Coherence*, gathers the determinants of the site and landscape. (...) *Language Coherence*, comprises the expressive means that compose the language of architecture, mainly its formal and spatial structures.’ Refer fig. 2.2.

As a result, vernacular architecture as well as its environment supposedly communicates the social variables of the people – ‘status, rank, power, and social and family organization (...) beliefs, ideals, meanings, attitude about space, life, and death, the ideal life,’ (Rapoport, 2006), regardless of its period in time. It is important for this study to understand and comprehend these definitions of vernacular architecture, including all aspects – traditional or contemporary, physical or immaterial, as well as the associated human actions – in order to construct a complete theoretical context of the people who build the traditional Malay house.

2.1.1 Malaysian vernacular architecture

The vernacular architecture in Malaysia fits within the Southeast Asia framework and thus shares some cultural features, notably in its language, climatic perspectives and socio-cultural factors (Ju and Kim, 2017). Waterson (Waterson, 1997, pp. 11–14) observed that cultures and ways of life among the countries in this region have similarities despite the geographical distance among them. It was also suggested that Malaysia belongs to the Austronesian language family - which was developed out of the common mother language that spans most parts of Southeast Asia²⁰.

The similarities in the climatic perspectives of Southeast Asian vernacular architecture responds to the region’s hot and humid tropical climate. Strategies pertaining to the roof, walls and raised structures all contribute to the way these structures maximise ventilation for the ‘enjoyment’ of the occupant (Ahmad, 2007; See Waterson, 2010). There is also a shared correlation between vernacular architecture and associated cultural, spiritual, social and symbolic meaning. The practice of indigenous beliefs and spirit idolisation in everyday culture is prominent among the populations of Southeast Asia, and this extends to housing. This is evident in the ways that houses symbolise the ‘living’, building processes adhere to sacred practices, and the social hierarchy and order of spatial properties are governed (Ariffin, 2001, 2017; Hanan,

²⁰ The linguist Bellwood (2004, quoted in Ju and Kim, 2017, note 2) was first to express that the language was developed out of the same language.

2017; Ju and Kim, 2017; Waterson, 1997). These traits are common within Malaysian regional architecture.



Figure 2.3 The Traditional Malay Houses of Terengganu. They are small units of houses arranged and connected with a timber platform called 'selang'. Source: Author, 2015.

The traditional Malay house is considered as a vernacular image in Malaysian regional architecture, designed and built by Malay people in Peninsular Malaysia. It is an example of pile dwelling.²¹ It is normally located in villages and has been neglected in recent years due to a prioritising of urban developments. Currently, Malay houses are considered 'outdated' (Lim, 1987), due to perceptions that contemporary mass housing and their materials have more prestige and status.²² There has been excessive admiration towards Western house forms, especially of the modern period. In response, Lim (1987) advocated the revival of traditional Malay houses to prevent their extinction, and loss of skills in construction and maintenance. However,

²¹ There are three categories of dwellings: semi-subterranean dwellings, surface dwellings and pile dwellings (Nasir and Wan Teh, 2011). The Pile dwellings or pile-built structures that adopted the post and beam structural construction were common in Southeast Asia's dwellings (Ju and Kim, 2017).

²² The perception of modern materials as a higher status symbol is also evident in the people of Djenne, Mali in Africa. See Marchand, 2006.

the focus is not on imitation but learning and adapting traditional techniques within the contemporary architectural scene.

‘Vernacular architecture has been seen as one of the ways in which regional and national character survived political amalgamations which makes up the present nation’ (Brunskill, 1971), and therefore the vernacular forms an important part of contemporary discussions about the national identity of architecture in Malaysia. Although there has been an increase in interest in Malaysian vernacular architecture and its characteristics over the years, the difficulty in developing a symbolic identity representing contemporary Malaysian regional architecture is not an isolated occurrence but an international phenomenon (Maudlin, 2009). Attempts to adapt vernacular features in Malaysia have been futile, partly due to the domestic nature of Malaysian vernacular architecture (Ariffin, 2001; Nasir and Wan Teh, 2011), resulting in unsuccessful and inappropriate attempts at adaptation into modern non-domestic buildings²³ (Ahmad, 2007).

As a result, the contemporary Malaysian architectural scene is diverse, messy and lacking in regional identity (Yeang, 1978). Abdul Rahman (1999, p. 2) posits that there is a lack of enthusiasm in the architectural scene; either from architects, clients, architectural students or the public, for pursuing an agenda promoting regional characteristics in the building industry. Abdul Rahman believes that this ‘sad state of affairs is due to a lack of understanding of the heritage and the roots of architecture’ within the Malay architectural worldview. Ahmad (2007) adds that contemporary architects have failed to understand the implicit language of Malay architecture. Therefore further study of historic structures and the cultural context of Malaysian architecture is essential.

Malay houses portray valuable design and building techniques that have ‘brought together the history of the past’ along with it (Harun, 2011, p. 45). In comparison to contemporary mass housing developments which are designed as typical and homogenous, cultural influences are more apparent and established in the design of traditional houses (Ismail, 2012). This is due to the fact that traditional Malay houses were specifically designed to reflect the lifestyle and wishes of the prospective owners, purposely ‘by and from the housewife’ (Ariffin, 2017).



Figure 2.4 Timber is used throughout the Malay house building material. Image shows the building parts of Malay Gerbang (Gateway). Source: Author.

²³ For further reading, see Rasdi, M.T.H.M., 2007. Housing Crisis: Back to a Humanistic Agenda. Penerbit UTM.

“...the traditional Malay house is vulnerable, mainly due to its use of timber as a structural material, the harsh tropical climatic conditions, and pressures from urbanisation.”

Interestingly, it is possible that this cultural background is why personalisation of contemporary mass housing is prevalent in Malaysia, particularly terraced houses.²⁴ Despite the sophistication of the techniques employed in building traditional Malay houses, the house as an example of tangible heritage is arguably short-lived, as they are currently ‘neglected and deteriorate’ rapidly due to the use of timber as the main building material (Harun, 2011).

Compared to the tangible heritage of buildings in a western context - generally constructed out of bricks and stones that survived for decades or centuries – the traditional Malay house is vulnerable, mainly due to its use of timber as a structural material, the harsh tropical climatic conditions, and pressures from urbanisation. Inevitably, this example of architectural heritage is declining and is likely to disappear altogether, but perhaps more disturbingly, the process of building the house is also becoming a dying craft. For this reason, this study will probe into and identify the intangible cultural heritage of the building culture and practices of the Malay *tukang* themselves.

2.1.2 Characteristics of Malay vernacular

The physical characteristics of traditional Malay houses have been discussed elsewhere in detail, therefore this will not be the focus of this study (refer section 1.4.3 on existing studies). Nonetheless, this section highlights important elements within the traditional house which will be relevant to the subsequent section, which emphasises the Malay house as an ephemeral and dynamic structure, physically and spiritually.

Traditional Malay houses are distinguished from vernacular houses throughout South East Asia by features such as their light wooden construction on structural stilts, non-boat character²⁵ and their small roof typology (Waterson, 1997).

²⁴ Further reading on personalisation phenomenon of mass housing in Malaysia,, see: Zaiton Abdul Rahim. (2000). The characteristics, changes and effects of building elements in the two storey public low cost housing on the Malay culture core. Universiti Putra Malaysia, Serdang, (or) Saji, N.B., 2012. A Review of Malaysian Terraced House Design and the Tendency of Changing. Journal of Sustainable Development 5, p140.

²⁵ Most of the houses in South East Asia have large and high roofs with shapes resembling a ship or a boat.

In the words of Lundberg (2008, p. 6):

'I am reminded of the growth and spread of a tree - a tree house. (...) made of timber, set on stilts, its open shutters and glassless windows peering out into the branches and canopies of the surrounding garden of trees that are growing into a dream of jungles'.

Although simple in form, the mastery of building the traditional Malay house confirms to the general principles of South East Asian vernacular heritage; it incorporates the doctrines of mystical beliefs, religion, culture and sustainability (Lim, 1987). This was as a result of its inclination towards the Malay culture and indigenous vernacular adaptation (M. M. Tahir et al., 2010). As such, the Malay house imposes an indigenous mathematical spatial order, coined as 'magic measurement' (Ariffin, 2000) that regulates the modular and typological rule-system of the built form to dictate the 'growth' pattern of its inhabitants (Chen et al., 2008).



Figure 2.5 Profiles of type of houses in South East Asia. House type from left to right: Thailand, Indonesia, Myanmar, Vietnam, Malaysia (Malay house).

In addition, the modular construction, lightweight prefabricated structure, and native use of timber for aesthetic and performance reasons has similar virtues to a modern prefabrication construction system (Sani and Ismail, 2006). In these regards, the fundamental concept of the Malay house reflects the anthropometrics of its inhabitants as well as reflecting the sustainability of their practice, the local economy and the tropical climate (Lim, 1987).

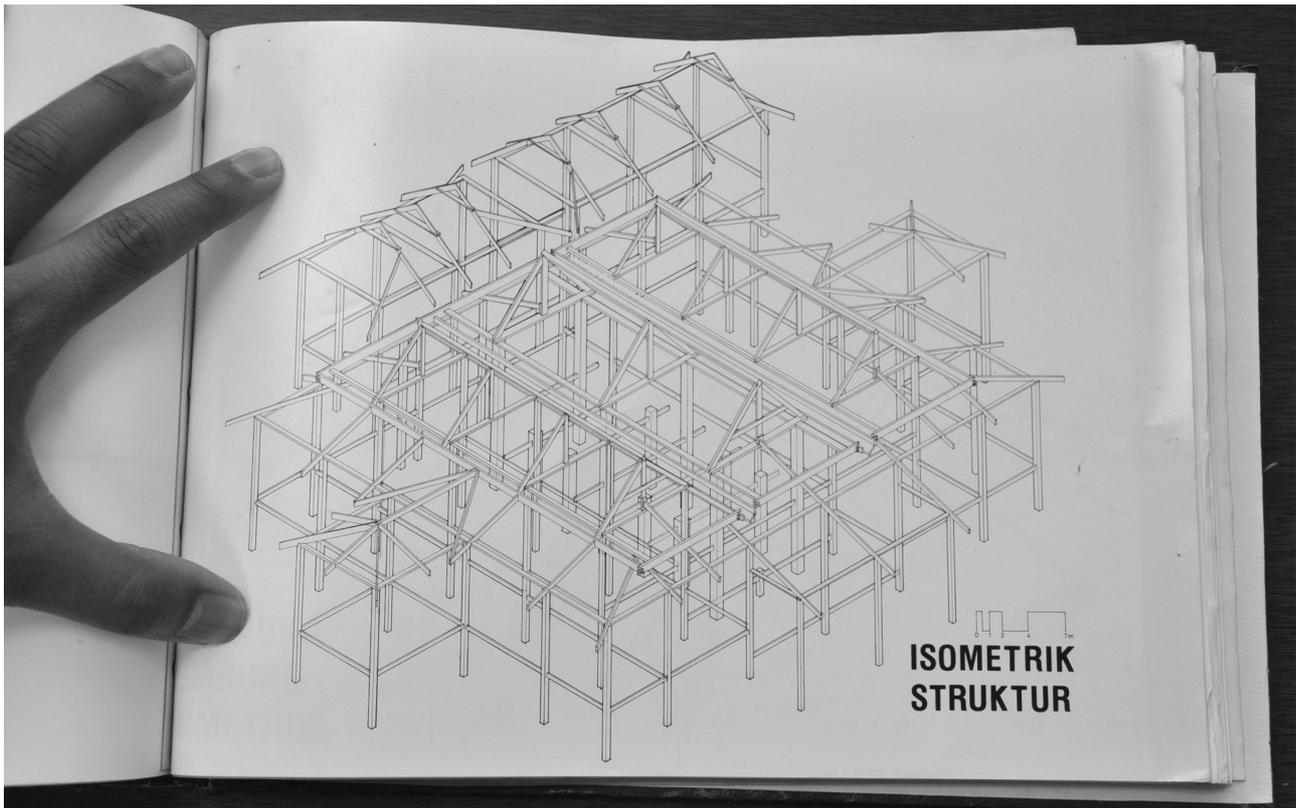


Figure 2.6 Schematic of a Malay house structural composition (Terengganu type) .The image captured from the Measured drawing of Losong Haji Su house documentation from Pusat Kajian Alam Bina Dunia Melayu (KALAM), Universiti Teknologi Malaysia. Source: Author, 2014

The form of Malay houses are constructed of timber framed post and beam structures supporting a pitch gable roof called the *bumbung panjang* (long roof) which is the original type form of Malay houses throughout Peninsular Malaysia (Said, 2007). It is distinguished by the light wood stilts structure while the earliest form of a Malay house consists of a six-column structure and further developed into a twelve-column structure to accommodate needs (Chen et al., 2008; Gullick, 2012).²⁶ The column structures are raised two to eight feet from the ground, where in the past, it simply 'distinguished Malay from Chinese or Indian houses' (Firth, 1943, p. 21)²⁷. Although the nature of timber is short-lived, it is abundant in this part of the world; hence the use of timber reflects the skills and indigenous advantage of the Malay *tukang* in woodcraft.

²⁶ Hilton (1992) notes that nine-column structures are common in recent traditional Malay houses.

²⁷ Raised floor houses were always associated with tropical houses as to cool down the temperature, but Firth (1943) points out the use of the space under the house for convenient waste disposal, usually from cooking.

Components of the house consist of structural as well as non-structural members connected using the *tanggam*²⁸ system with a varied typology of detail design that plays a part in the function and strength of the structure (Sabil and Utaberta, 2011). The *tanggam* system is in tandem with the overall concept of the structure where diagonal structural elements are not required (Lim, 1987). Nailing would be too weak, therefore a *baji* (timber wedges) - or sometimes wooden dowels - are essential, where the joints can be tightened from time to time (Hilton, 1992). Gibbs (1987) may have classified the *baji* as part of the structural member of the *tanggam* system.

The *tanggam* system facilitates certain conditions when the occupants were required to move the house elsewhere, either by disassembling or transporting the whole structure intact with the help of villagers. The process of taking apart building components for relocation or to salvage is called disassembly and assembly (*buka pasang*). With the introduction of power-operated sawmills, standard timber sizes cut to perfection can be achieved thus introducing more elaborate structural possibilities evident with the introduction of the new roof form typology (Hilton, 1956).

The basic form of the traditional Malay house has been perfected in its building system, characterised by structural integrity as well as its spatial function, a result of many developments in material and techniques throughout centuries; hence the current form is considered as a 'finite style' already reaching the peak of its maturity (Mohamad Rasdi et al., 2005, p. 66). While these indicate the importance of progression in techniques, the traditional building system itself allows for new adaptations. This is evident, as the house has endured several different stages in amalgamation of form and materials, evolving through Portuguese, Dutch and British architectural amalgamations. It is also a manifestation of a building type that is fundamental to Malay society and culture but malleable and adapted throughout different generations



Figure 2.7 Top: *Tanggam* connection used to join two components together to increase length. Below: *Tanggam* connection used at the staircase. Source: Author, 2014

²⁸ *Tanggam* is a wood joinery system adopted by the Malay *tukang* in the assembly of Malay houses when nails and screws were absent. Mortise and tenon joints adjoin perpendicular timber pieces; hence the layout of the house was generally square. At times, wooden dowels or *baji* (timber wedges) act as additional fasteners and though *tanggam* is a basic system, it is both simplified and strong.

and influences. As the house is flexible, it could be dismantled and re-erected elsewhere effortlessly (Firth, 1966, p.23).

The Malay house is an extension of the environment in which it evolved. Hence, the house viewed as an exterior form is blended into the background of the *kampung* (village)²⁹ setting, while the inside is an expression of that of outside material. Additionally, Malays see their surroundings and hidden forces, as their source of inspiration and reference from an animating spirit - a vital 'spark' or soul (Winstedt, 2007, p. 28), which is termed as *semangat*. Before the introduction of Islam, every action and ritual was conceived in relation to nature, hence the characteristics of the house were constantly understood in association with nature's laws. In a modern context, this notion of devotion towards the environment could relate with vernacular or environmental architecture despite their limited meaning within the Malay culture.

2.1.3 Poetics of Malay architecture

Traditional Malay culture believed in the spirits of all organic and inorganic things (Lim, 1987), a fact which is evident in the symbolic meanings behind the construction process and its elements such as the *semangat rumah* or spirit of the house (Amat and Rashid, 2009; Ariffin, 2001). The *semangat rumah* is manifested as a mystical soul responsible for the well-being of occupants. Therefore, every aspect of the house design is reflected in spiritual beliefs towards the environment, which influences the considerations of house location, main structure position, house orientation and building rituals.

“Semangat rumah is manifested as a mystical soul responsible for the well-being of occupants.”

Physically as well as metaphysically, Ariffin (2001) expressed the importance to achieve harmony or *rasi*: the fitness, suitability and comfort of the occupants with the house as well as with the *semangat*. Furthermore, Ariffin points out that a primary aspect of *rasi* is the body

²⁹ The general term '*kampung*' is associated with the Malay vernacular architecture as twofold: one is referring to a threshold area where two houses or more existed, while the second indicates a network between local inhabitants and their '*masjid*' or mosque (central building) in their own region (Wan Ismail, 2005).

measurement of the mother of the house³⁰ that provides both the tangible and intangible dimension of the Malay house and its construction (Ibid, 2001)³¹.

Considering the above, a Malay house is thought to be an abstraction of the human body (Ju and Kim, 2017; Waterson, 1997) and subsequently is a reflection of its inhabitants. As a result, houses are constructed in their 'own image' - the Malay people - and therefore become an extension of one's self (Carsten and Hugh-Jones, 1995, pp. 3-4). While this may not be obvious, the characteristics of the head, body and feet are rendered in a clear division of roof, walls and raised stilts (Ariffin, 2001; Ju and Kim, 2017),³² an anthropomistic idea that is common in Southeast Asian countries.

Moreover, the *kampung* or surrounding of the house broadens this image of one's self, acting as an extension of Malay houses themselves. For example, the act of communal feasts could strengthen the notion of self identity (Carsten and Hugh-Jones, 1995) as it becomes a fertile ground for cultural expressions and participation, accessible for everyone. Thus, investigating the Malay house requires understanding both of the physical characteristics as well as the values in the immaterial, conceptual, emotional and intangible qualities described as the 'poetics'. Fundamentally, 'architecture [is said to] arise from the notion of immaterial essence, mainly of poetry'.³³

Poetic in its adjective meaning implies 'having an imaginative or sensitively emotional style of expression'.³⁴ In an architectural sense this relates to the relationship of the behaviours, actions and interactions of a human with a building and space or vice versa. In other words, it could be described in contrast to the word *technic*, which involves the physical elements of architecture such as form, space, and materials, or recently

"Architecture is inhabited not only in the activities and experience of a normal human existence, but also through imagination"

³⁰ Or normally the mother of the house, hence the main building is literally called the mother's house or *rumah ibu*. See section 2.2.1.

³¹ Further reading on the intangible measurement and dimension of Malay houses, refer Ariffin (2000).

³² This is apparent when looking at the elevation view of the Malay house.

³³ Almeida P, *Os Três Polos da Criação Arquitectónica. In Apontamentos para uma Teoria da Arquitectura* (Trans: Notes for a Theory of Architecture). Lisboa: Horizonte; 2008, quoted in Alves (2017).

³⁴ Oxford Dictionary of English 2016, Oxford University Press.

redefined as a series of elements.³⁵ Hawkes (2007) in his introduction to *The Environmental Imagination*, described that ‘*technics* or *techniques* or *technologies* alone, however important their role, fail to touch the central point’ in understanding architecture. Though dealing with creative responses to the architectural environment, he argued that design relies upon ‘acts of imagination in which *technics* are bought to bear in the service of *poetic* ends.’ As such, architecture is inhabited not only in the activities and experience of a normal human existence, but also through imagination (Bachelard, 1992).

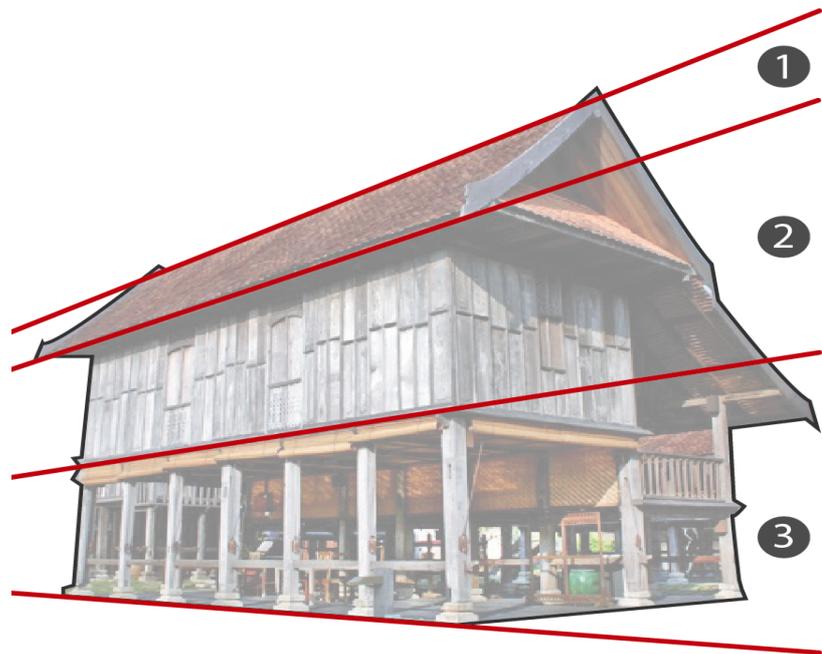


Figure 2.8 The Malay house is said to depict the anthropometric characteristics of a human with a (1) head, (2) body and (3) feet. Source: Author, 2018

Hawkes (2007) further emphasized the term *technics* as ‘objective or quantitative’, while *poetics* refers to the ‘subjective or qualitative’. While these are not exclusive categories, he argues that propositions in architecture must not be limited to ‘pragmatic prescription and technical realization,’ thus in understanding the Malay house, the poetics associated with it should be embraced as part of its existence, from conception to construction and inhabitation. By doing this, Robinson

³⁵ The Venice Biennale in 2014 curated by Rem Koolhaas depicts architecture as an integrated system of elements or components: doors, windows, ceilings etc. which have been said to be lost from the architect’s control.

(1990) argues that one can discover conscious and unconscious responses in the scrutinising of architecture³⁶.

2.1.3.1 The measurable and un-measurable

For Sir John Soane³⁷, poetics in Western architecture were arguably captured as 'distinctive characters' in ancient (architectural) works that distinguish the works of 'artisans' or architects from a 'useful builder (..) without which architecture becomes little more than a mere routine, a mere mechanical art' (Watkin, 2000, p. 255). In this regard, tangible aspects of architecture such as traditional Malay houses are a patina of creativity, imagination or beauty, which forms the expression in the poetics of Malay houses. Therefore this suggests that the tangible and the 'unseen' or intangible are both relevant and related.

Similarly in looking at contemporary practices, the architect Louis Kahn, 'saw architecture as the meeting of the measurable and the un-measurable' (Lobell and Kahn, 1979), a duality similar to the concept in architecture as having tangible and intangible or quantitative and qualitative respectively.

This notion of the measurable and un-measurable is precisely described by Louis Kahn:

"I only wish that the first really worthwhile discovery of science would be that it recognised that the un-measurable is what they're really fighting to understand, and that the measurable is only the servant of the un-measurable; that everything that man makes must be fundamentally un-measurable."

The un-measurable described by Kahn (which could similarly illustrate the 'intangible', 'immaterial', or 'poetics') is an important element that should be understood and reflected within the study. This outlook is relevant not only in traditional architecture but also contemporary

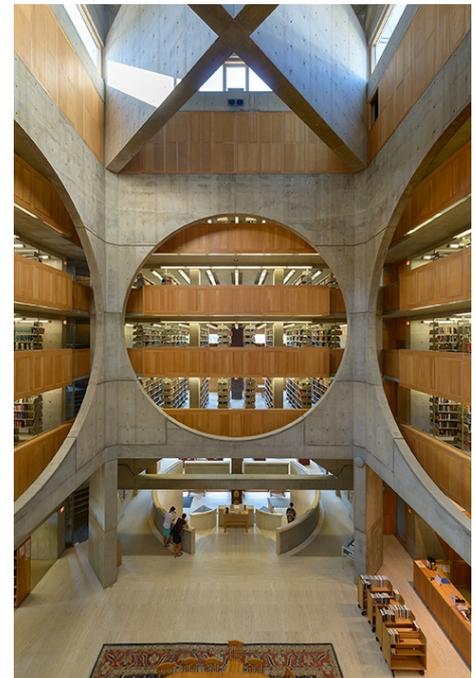


Figure 2.9 Louis Kahn's library design at Phillips Exter Academy deploys plane raw concrete finish with teak panelling and a dramatic circle form. Photography by John W. Hession. Source: www.nhhome.com/magazine.com/January-February-2016/Poetry-in-design

³⁶ Robinson (1990) uses the term mythopoetics, that are equally important when learning and understanding architecture.

³⁷ Sir John Soane was an English architect, born in 1753 and is the son of a bricklayer specialised in the Neo-Classical style. He was the Professor of Architecture at the Royal Academy and an official architect to the Office of Works prior to receiving a knighthood at the age of 78 in 1831.

buildings. It may also extend to the traditional building culture as practised until recently. As the physical description of a Malay house is examined, the study emphasises the aspects that are hidden from the naked eye that can be found within the minds and hearts of the people, in particular the builder or *tukang*. The approach taken in this study is to seek clarification from the Malay *tukang* themselves. Perhaps by acknowledging the un-measurable aspect of a Malay house, it could be understood similarly as what was perceived from the measurable.

2.1.3.3. Human expressions, memory and experience

'If we define ourselves and the world as measurable, our architecture will be measurable and without Spirit, but if we allow ourselves to be open to the meeting of the measurable and un-measurable, our architecture can become a celebration of that meeting and the abode of the Spirit.' (Louis I Kahn)

An interesting definition of the poetic can be taken from Louis Kahn's explanation of the un-measurable, that was also described as "Silence" (Lobell and Kahn, 1979); something that may be unspoken but communicated in a different form, and perhaps in different perception. In the case of the Malay building culture, it could potentially relate to the narrative of time – concerning materiality³⁸ – or somatic rituals in the actions that define and physically relate to their cultural context. The performance of rituals, whether affecting the physical landscape or not, can alter ways meaning is perceived and created – physically and cognitively to both the performer and observer (Kyriakidis, 2007b). These changes, often in a form of visual enactment, act as, 'markers and memorials, enforce collective memory, and can aggressively appropriate the landscape [settings]' (Ibid, 2007b, p. 299). Therefore, the "Silence" of the rituals is in fact an expressive means of culture and the meanings they entail within the memories of a community.

Or perhaps, the poetics of Malay houses could be described from the symbolic relationship of the *tukang* and material characteristics of the

³⁸ Berger's observation of his workshop or *charpente* as 'filled with time'; 'There is the time it took for the trees to grow, the time to let their wood dry, the time to build with them and - now that the building has reached the end of its useful life and its planks can fetch a good price elsewhere - the time spent putting away, taking out and pulling down' (Berger, 2005, p. 144 cited Ingold, 2009)

house – wood or timber. Lundberg (2008) once described this concept upon her experience of a Malay house:

‘simultaneously the carver (or tukang) becomes like some strange composite creature: part human, part wood’.

While the aspects of the building culture described in the following sub-topics represents a formal portrayal of procedural tasks in building Malay houses, it is essential to acknowledge the existence of poetics within it. In the same way architectural research is conducted, though persistently and increasingly considered methodological³⁹, the substances of the matter will always rely on intuition rather than merely logic.⁴⁰ Complementary to this, Bernard Rudofsky presents vernacular architecture as an art form within the crossroads of human intellect and creativity, thus positioning the building process as a ‘spontaneous’ experience.⁴¹

An illustration in the Malay building culture could best relate with the values in the traditional Malay carving, conveyed in a form of poetry. The poetry, translated by Abdullah Muhammad (Nakula) expresses the personality of Malay people: having a noble character that desires peace, in a form of Malay carvings⁴² as described:

*“Tumbuh Berpunca, Punca Penuh Rahsia,
Tajam Tidak Menujah Lawan, Lilit Tidak Memaut Kawan”⁴³
- Abdullah Muhammad (Nakula)*

³⁹ For example, previous research into Malay houses contemplates upon its procedural, technical and structural aspects, environmental impact, spatial functions and typological influence.

⁴⁰ Alvar Aalto, ‘The Humanizing of Architecture’, first published in *Technology Review*, 1940, reprinted in Göran Schildt (ed.) *Sketches*, op. cit.

⁴¹ See: Rudofsky, B., 1987. *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*, Reprint edition. ed. University of New Mexico Press, Albuquerque.

⁴² Perbadanan Kemajuan Kraftangan Malaysia, 2009. *Ukiran kayu warisan Melayu*. [trans. Malay Heritage Wood Carvings]. Perbadanan Kemajuan Kraftangan Malaysia, Kuala Lumpur, Malaysia. See page 77.

⁴³ Authors literal translation of the poetry; “Grown from a source, The source is full of secrets, Sharp but doesn’t thrust rivals, Shrouds but doesn’t cover friends.”

The poetry begins to explain about the source (*Tumbuh Berpunca*), the ultimate source of life, the almighty God, that owns heaven and the earth and everything within it. The source is portrayed in the Malay carvings as the beginning of a thing or a lineage in ancestry, thus the motifs of traditional Malay carvings were shown to begin from something. The poetry then describes of the secrets (*Punca Penuh Rahsia*), associated with the supremacy and the authority of God in comparison to the limits of human thinking. Secrets arouse doubts, thus questioning nature, hence the source of the motifs of the woodcarvings are usually hidden from behind an object (ie. pot, flower or a leaf).

Subsequently, the poetry continues to portray the aspect of tolerance among the Malays (*Tajam tidak Menujah Lawan*) where the tip of plant motifs within Malay woodcarvings are normally portrayed in prostration of each other to avoid conflict. Finally, the aspect of fair and healthy competition in life is depicted (*Lilit Tidak Memaut Kawan*), where the shroudings of the motifs in woodworking does not interfere or damage others, rather in harmony. These are the poetics of Malay characteristics embodied within the craftsmanship of traditional Malay woodworking and conversely could be translated into the Malay building culture.

2.1.4 Building craft

Craft is defined in The Oxford Dictionary as ‘an activity involving skill in making things by hand’ that denotes a man-made process in producing an artefact. Likewise, craft is the application of skills and material-based knowledge within a small and limited scale of production (Adamson, 2010). Esther Leslie, in “Walter Benjamin: Traces of Craft”⁴⁴, mentions that craft is similar to storytelling, embodying time and meaning through practice. Hence, building the Malay house is considered a form of craft, or building craft, as it is grounded on traditional skills and knowledge of the *tukang* based on the principles and meaning in local Malay culture. In addition, the understanding of culture with existing environmental condition suggests a specific aspect in the characteristic of the house that is unique and at the same time indigenous.

*“... craft is the application of skills and material-based knowledge within a small and limited scale of production”
(Adamson, 2010)*

⁴⁴ Leslie, Esther. “Walter Benjamin: Traces of Craft.” *The Craft Reader*, by Glenn Adamson. Berg Publishers (2010) pp. 386–393.

Malay houses are made from wood by a traditional *tukang*. However, it is also common that any Malay peasant or owner of the house has the ability and skills required to construct it themselves (Abdul Rahman, 1999; Firth, 1943, p. 23). In the same way, Gullick (2012, p. 81) describes the process of building a traditional Malay house as a craft and not a profession as there were no 'builders' as such. The process of building the house also includes local *kampung* (village) residents to contribute as part of a *gotong-royong* (mutual assistance) activity due to the strong social relationships and close proximity between the houses in the villages (Raduwana et al., 2012).



Figure 2.10 A family in *Kampung Rusila, Terengganu* presenting family cooperation. The husband replacing parts of the building component, while the wife and children providing leverage. Source: Strange, 1981, p. 138, figure 4.

This notion of collective or cooperative skilled advantage is similarly described as a 'collaborative craftsmanship' (Pallasmaa, 2009), while it suggests a similarity with Yanagi's (1989) image of 'folkcrafts': describing beauty derived from the power of 'natural process and an accepting heart' of communities - in particular a community of craftsmen or *tukang*. Interestingly, although a Malay house is typical in form and often constructed collectively⁴⁵, the house is rigorously made as a bespoke design for the occupants by adopting rituals to achieve this.

⁴⁵ Firth (1943, p.65 & 150) recorded that when a person wants to build a Malay house, they will call upon their family and friends to assist. This is common among Southeast Asian traditional vernacular house-building culture, and other parts of the world where co-operation among people is essential.



Figure 2.11 Perforated wall panels carved out from a symmetrical floral motif. Source: Said, 2002, fig.4.

The cultural significance of the house is echoed in the craft of woodcarvings as well as spatial organizations. Said (2002) notes that a typical Malay house would be adorned with more than twenty carved components, normally functioned as ventilation panels. Said further concludes that a *tukang* understands the importance of cultural identity, thus the motif of the woodcarvings resembles the Malay value system, rites and rituals (ibid, 2002). The motifs of carvings simultaneously become part of the hierarchy of space: plant patterns adorn the section of the house reserved for women, geometrical patterns for other functions (Kamarudin and Said, 2011), including for separation of spaces and entrances between men and women due to modesty (Chen et al., 2008).

The complexity and sophisticated workmanship of the carvings suggests a skillful and creative visual composition of Malay *tukang* (Kamarudin and Said, 2008) and a 'broader philosophical question concerning with ways of being and knowing' (Lundberg, 2008, p.8). As the Malay building culture lacks the literary foundation and thus relies on oral transmission, the house as a physical craft (or artefact) could potentially be a significant instrument of thought (Bourdieu, 1977, p. 89). Therefore, the building culture is similarly reflected in the creativity, dexterity and craftsmanship of the 'maker', and the manner in which the craft is exercised.

2.2 Malay Building Culture

Aspects of Malay building culture are considered to be rituals (see: Jones, 2016), as they consist of actions performed in sequential order including activities and mediation of symbolic meanings which are embedded in somatic gestures. Although the traditional Malay house is a 'self-build' house, a *tukang* occasionally participated in the building works, where he was also the *pawang* who conducted rituals throughout the process of design and construction. Meanwhile, the house owner and the village people generally contributed and became part of a collective skilled or unskilled labour force, referred to as 'collaborative craftsmanship' (Pallasmaa, 2009).

In this section the building process of a traditional Malay house is described in a general manner, as it may contain variations with building

processes from different regions within Malaysia. These differences include the actors involved, rituals conducted, procedural variations and others. Furthermore, the building process has been recorded comprehensively elsewhere (Ariffin, 2001; Asri, 2004; Gibbs, 1988; Hilton, 1956) so it was not considered necessary to repeat this effort. Nevertheless, the description below highlights the activities in relation to the actors involved, such as *tukang* and others they may be linked with. This is in order to highlight the intangible actions involved.

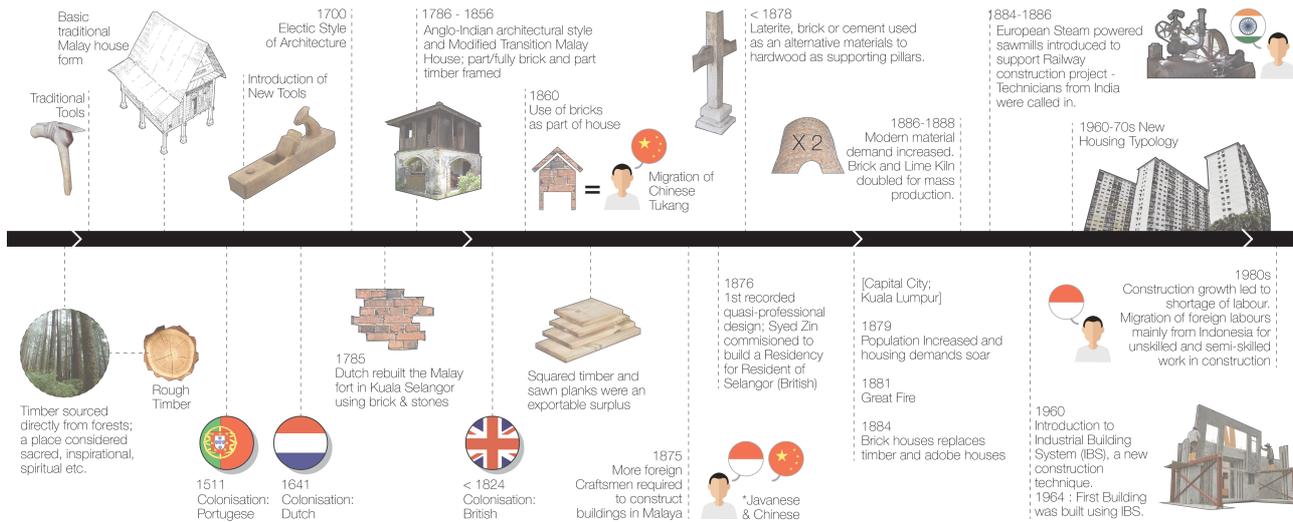


Figure 2.12 The schematic and simplified timeline of the development of building culture in Malaysia, derived from multiple references. It Source: Author, 2016.

2.2.1 Material Assembly

The initial process in building a Malay house is to determine the intent of the owner and the site. The selection of a house location is similar to the selection of a site for a *kampung* settlement, where it has to be auspicious towards different elements or beliefs. Consequently, the *pawang* or *bomoh*⁴⁶ is called to advise and perform systematic charms and rituals to determine the appropriateness of a site. Though the specific circumstances when a Malay master *tukang* was called in to assist the house owner in building a house are not known, the *tukang* in many cases was also a *pawang* that possessed the knowledge for rites and rituals (Abdul Rahman, 1999, p. 6; Lim, 1987, p. 98).

⁴⁶ *Pawang* or *bomoh* is a person believed to have certain mythical capability to control spirits and spiritual forces.

Similarly, there is no extensive record of the type of initial agreement or list of requirements drawn up between a *tukang* and a client prior to construction, but it is suggested that this was usually a verbal agreement in front of witnesses (Nasir, 1985, p. 82), where an initial measurement based on the *dulang* module⁴⁷ was made (see Ariffin (2001). Nor is there a record of inscriptions by *tukang* on buildings made by them for future reference (ibid, 2001, p. 41, note. 1). Therefore the Malay *tukang* were believed to be involved in the earlier stages of the building process, acting both as the *tukang* and *pawang* simultaneously throughout the construction.

In other circumstances, a house owned by normal village folk was constructed by the occupant himself (Firth, 1943, p.23). Most males were capable of building houses or were a *tukang* in one form or another (Abdul Rahman, 1999, p. 6; Firth, 1943, p. 23). House building was generally straightforward and employed local materials (Gullick, 1987, p. 183), therefore house-building formed part of general knowledge (Fox, 2011, p. 148), and was often a social obligation within a village (Firth, 1943:1966). Meanwhile, the well-to-do house owners would hire their master *tukang* for a job, although the owners may have designed some of the house themselves (Abdul Rahman, 1999; Firth, 1943). Thus, the craftsman's relationship with the house (or artefact) varies and is dependent on the level of involvement in the period, or activities engaged by the *tukang* during construction.

“Most males were capable of building houses or were a tukang in one form or another.”

Timber was acquired from the nearest forest, where it was felled, the bark was removed, and the tree was cut into pieces. The basic design of the traditional Malay house consisted of a six-point plan of timber posts, piling or *tiang*, distinguishing it from other non-Malay types (Hilton, 1992, pp. 41). Anything more than this, as explained by Hilton, can be analysed as a modular addition to the basic 9, 12 and 16 point plan; as the size of the house increased by adding column supports rather than by the size and space of the structures (ibid, 1992, p. 45). A nine-point plan as the minimal house form consists of *rumah ibu*⁴⁸ (mother's house

⁴⁷ *Dulang* is a tray used to serve food in a Malay culture that has a common size; hence it was suggested that it serves to become the reference dimension, similar to the mats (*tikar*) or the *depa* system (refer section 2.2.2) used, for the house module system.

⁴⁸ *Rumah Ibu* or Mother's house is referring to the main space of Malay houses where Malays have their meeting, adult sleeping area and other main activities.

or main house) and the *serambi gantung* (front verandah), without the kitchen and *anjung* area.⁴⁹

The minimum nine point or *tiang* (posts) were extracted from one large tree trunk, shaped into a square section and split into nine equal sections based on the resource principle of the Malay house of 'one house, one tree' shown in figure 2.12 (Gibbs, 1988, Waterson, 1993, p. 118). It is important that the *tiang* of the completed house are arranged in the manner of the relationship to each other that they had in the trunk of the tree (Gibbs, 1988, p. 79).⁵⁰ Although the concept of 'one house one tree' appears symbolic and poetic in nature, it also represents a meticulous attention to workmanship and efficiency in the use of material.

The type of timber selected was also important in terms of strength, visual appearance, as well as systems of belief.⁵¹ For instance, a *merbau* tree is haunted according to Malay tradition and, even if used, should only be utilised for the *rumah ibu*, but it is a taboo to use this material in the *dapur* (kitchen)⁵² area, as it is believed that doing this would result in a household being disturbed by strange noises (Gibbs, 1988, p. 63). A *Cenghal mas*, a type of teak, was known to be the best timber for the main structure of the house, but currently it is expensive. Hence, the thought process behind the selection and consideration of timber materials was not simply technical but also included the understanding of spirits and beliefs⁵³.

In the author's point of view, it can be referred to the living area where the whole family gets together.

⁴⁹ In contrast Hilton (1956) described the twelve-point plan as the basic Malay house as it has additional *ruang* (spaces) that were essential to a functioning house.

⁵⁰ This is said to prevent wrap, as the concept is to imitate the nature than opposing it. A similar concept in a Japanese view of aesthetics called *Wabi-sabi*, which among others centred on indigenous integrity of natural objects and its processes.

⁵¹ Other Malay belief includes: location of the tree in the forest also represents good or bad luck, if the tree is possessed with evil spirits that it should be cut early morning or late afternoon, orientation of the action when cutting is for certain types of tree and to avoid timber with too many cracks and knots (Gibbs, 1988, pp. 66)

⁵² *Dapur* (kitchen) is normally connected with the *rumah ibu* with the *selang* (walkway link) or a *rumah tengah* (middle house normally for dining).

⁵³ In technical terms, one can argue that a timber has different properties where in the case of the *merbau* tree being possessed, it could well be due to its low

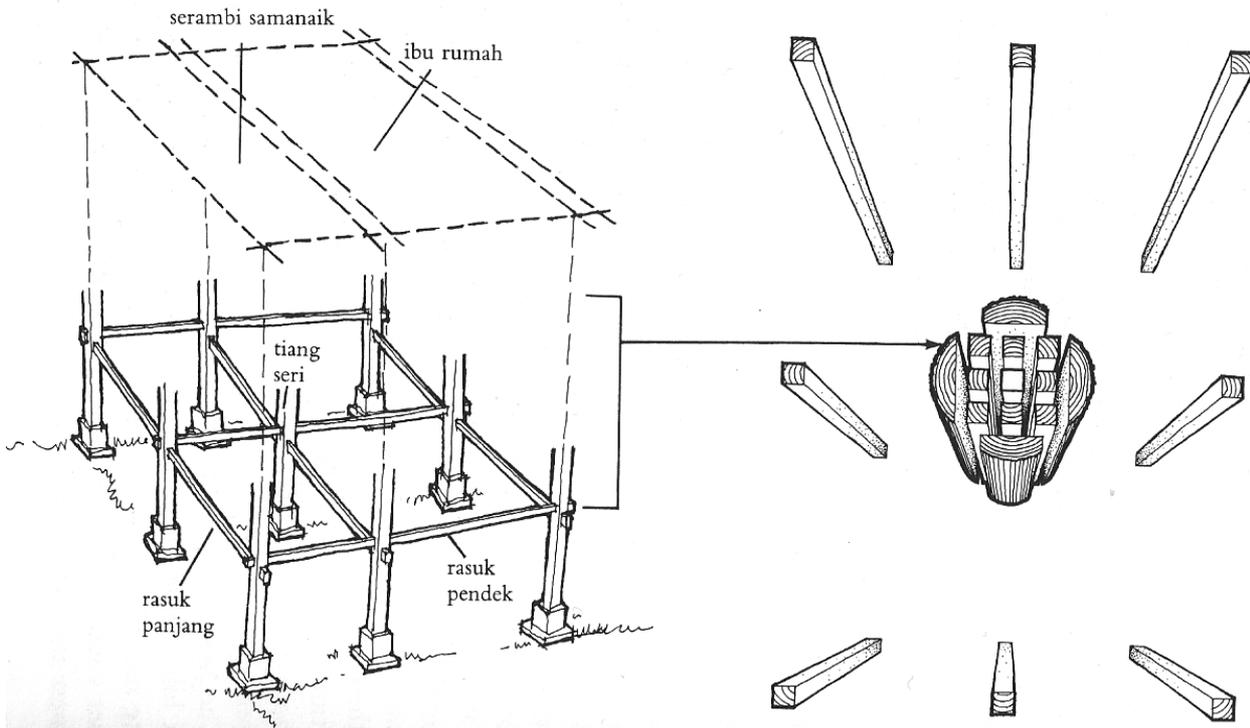


Figure 2.13 The principle of the 'one house, one tree' adopted in building the traditional Malay house. Source: Gibbs, 1988, p.80

After a special ceremony was conducted to placate the spirits of the forest, and the trees were cut into the required pieces, the timber was carried to the riverbank by buffaloes or elephants. As described by Gullick (2012, pp. 79), generally the timber was extracted at the end of the dry season when the river level was sufficient to float the logs along it. Despite the rationality, the Malays also believed that there are special months when the houses should be built (See; Al-Ahmadi, 2000), such as in the month of *Zulhijah*⁵⁴, during which the owner will acquire wealth and will be blessed by God⁵⁵. Therefore, the *pawang* offered advice on a suitable date. The manner in which material resources and handling

strength which results in sounds from shaking or shuddering. However, further investigation and research should be conducted.

⁵⁴ *Zulhijah* is a month within the Islamic calendar. The author predicts that after the Malays embraced the religion that the Islamic months are being used but no other source can describe for the period before.

⁵⁵ More often than not, the auspicious dates proposed were said to be wisdom in common sense, suitable for the type of activities held. One example is the celebration of Malay weddings held at night should be performed when the full moon could reflect lights on such gatherings (Firth, 1943, p. 149).

were emphasised throughout Malay building culture is an example of 'ritual economy', to portray the complex relationship of consumption, material production and provisioning with ceremonial events (McAnany and Christian Wells, 2008).

At this period of the building process, the Malay *tukang* was expected to lead the excursion for the selection of the tree, the cutting process and preparation for transportation, in which he might be assisted by fellow *tukang* or village folk, however the number of people required is unrecorded. The knowledge required at this stage is proficiency in the selection of a site and a date for building, the location of trees, and the selection of a type of timber, as well as the procedural aspects of the felling, cutting and preparation of the tree for transportation.

2.2.2 Tools and system

Traditional Malay *tukang* built houses using their bare hands by techniques such as holding, carrying, tilting and raising (Ariffin, 2001, p. 253) as part of the process of making and handling of building components. To prepare these building components, hand tools such as the chisel, saw, axe, hammer and auger were used (Figure 2.13). Other important tools constructed by the *tukang* himself included a *kuda-kuda*: a tool to support the large timber members as he made the joints (Gibbs, 1988, p. 71). Nails were not used in the traditional Malay house: instead *baji* (timber wedges) were used to strengthen the timber joints in a method known as the *tanggam* system (Ariffin, 2001; Lim, 1987; Nasir and Wan Teh, 2011; Sabil and Utaberta, 2011). Since the structural framework of the Malay house does not utilise diagonal structural members (Hilton, 1992, p. 41; Lim, 1987), the *baji* has to be tightened from time to time to reinforce the loose timber components.

One advantage of using the *tanggam* system is to accommodate the flexibility of the traditional Malay house, where the spatial hierarchy can be reorganised based on the needs of the occupants. Additional spaces or *rumah* (house) can be attached within the existing structure, and in some instances part of the house is divided among the children or sections removed and attached elsewhere (Gibbs, 1988, p. 33). In addition, the *tanggam* system provides the means for the occupants to disassemble and transport the houses elsewhere, freely adapting the structure to a different site (Gibbs, 1988, p. 39).

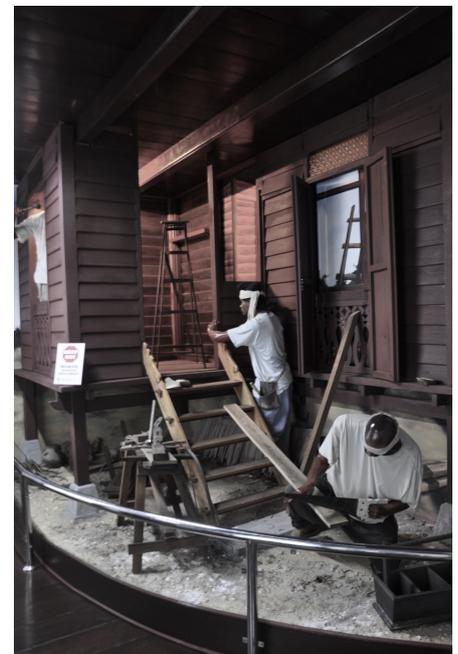


Figure 2.14 The house-building process depicted in Malacca's Museum of Architecture. Source: Author, 2014

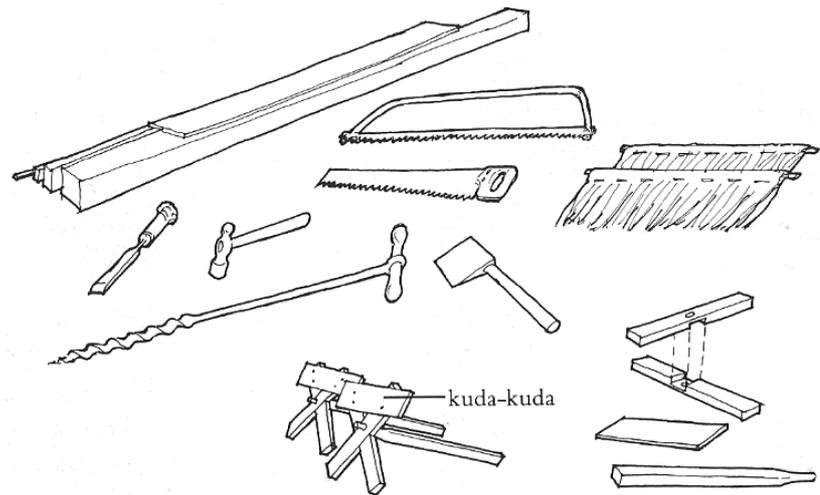


Figure 2.15 Type of traditional tools used by the tukang. Source: Gibbs, 1988, p.72.

The Malay *tukang* adopted their own system of measurements using parts of their hand and body as a unit, such as *ketak*, *jengkal*, *buku*, *hasta* and *depa* (figure 5). The measurement system is used in the preparations of the timbers, and thus dimensions vary from one *tukang* to another. In addition, *tukang* will also use the measurements of the *ibu rumah* (mother of the house) to dictate the proportion of the house. The Malay woman is considered as the caretaker of the house and traditionally carried out most of her daily activities within the house, hence the term used to refer to the main house is *rumah ibu* (Mother's house).

By adopting ritual measuring procedures from *ibu rumah* (mother of the house), the overall length of the house is first established in the *bendul*⁵⁶ component. Consequently, a proportional and relative measurement system is used to identify the height of the *tiang* (column), the floor joists, the position and width of the main door, and other doors as required. The use of an indigenous measuring system demonstrates that a Malay house has an intimate relationship to the human scale and that the 'relationship between the movement of the body and the space of a building could be quantified and manifested through this measurement medium. (...) The possible movement of the body is presented by size [and] through arrangement of size, the space for a behaviour becomes predictable' (Kong, 2016, p. 245).

⁵⁶ Part of the building component functioned as a skirting-board or a frame that surrounds and secures the whole house.

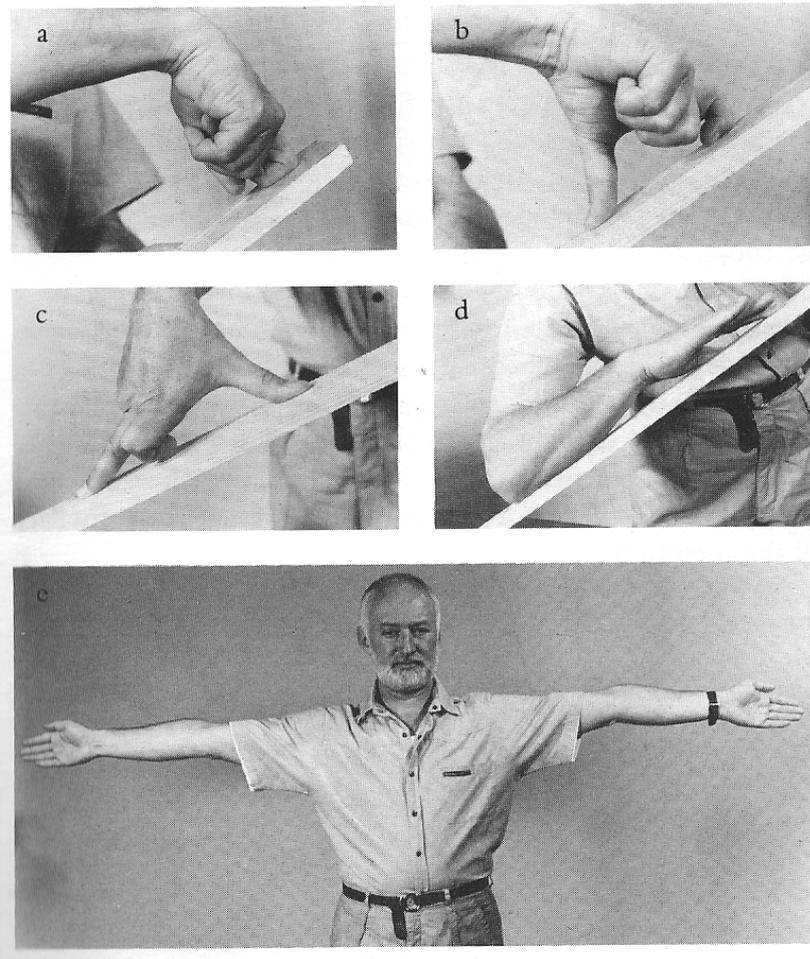


Figure 2.16 The Malay measurement system known as the *Depa* measurement. Source: Gibbs, 1988, p. 73.

Once all the house components have been prepared, the next step is to identify the location of the first main pillar or *tiang seri*. The central pillar from the nine pieces, cut from the core of the tree becomes the *tiang seri* and it is important to maintain the arrangement of the *tiang* location in relation to its original position in the tree. Several rituals (figure 6) are conducted that vary regionally, however the aim of searching for the base of the house remains similar. This is well described by Gullick (2012, p. 80), Gibbs (1988, pp. 81), Hilton (1956, 1992), and Lim (1987, pp. 98).

The *Tiang Seri* is erected at an auspicious date considered as a good day, when a ceremony is held at a feast in the villages. During this period of the building process, the village folk attending the feast will take part in building as part of *gotong-royong* (mutual help or assistance), or

'cooperative labour', that is evident in the traditional building process in Southeast Asia (Ariffin, 2001; Hanan, 2017; Ju, 2017). As a result, village people feel empowered and take responsibility, which is then translated into a 'language of social interaction' (Jones and Kong, 2016, p. 156). The master *tukang* is in charge of coordinating the process of erecting and assembling the house, becoming the mediator between the building components and people⁵⁷. In the ritual of *tepung tawar*⁵⁸, incantations and recitations are sprinkled over the *tiang seri* and blessed with prayers before being erected first and followed by other *tiang*.



Figure 2.17 One of the rituals conducted to acquire the measurement and location of the house. Source: Lim, 1987

As alternative building materials have become accessible and cheap, some of the materials used in the traditional Malay house have changed. Initially, the *tiang* used were buried in the ground similar to pilings, or rested on hardwoods. Due to the vulnerability to attack by rot or termites, foundation stones were introduced, which Malay craftsmen chiseled by hand accordingly to take the feet of all the *tiang* (Gibbs, 1988, p. 70). Houses of wealthier people would use blocks of granite. Alternatively laterite earth was dug, cut to shape with a knife and then allowed to harden (Hilton, 1956, p. 137). Recently, the use of concrete footings with metal reinforcement is commonly found, though the traditional shape is still retained. Likewise, bamboo, woven into panels and reinforced with timber studs, was once used as walls (Ju et al., 2012,

⁵⁷ Ariffin (2001) illustrates this process for ways village folk could learn and understand the building process. The *tukang*, primarily the main builder or designer, becomes the teacher, while the others assist in helping to lift the main structures in place. However, this ceremonial process is currently forgotten.

⁵⁸ A rice flour mixture used for religious offerings.

p. 98), with bamboo flooring that has evolved into vertical or horizontal timber paneling.

With the introduction of power-operated sawmills, standard timber sizes cut to perfection can be achieved, introducing more elaborate structural possibilities evident with the introduction of new roof forms such as the *rumah limas*⁵⁹ (Hilton, 1956, p. 135). In addition, the timbers can now be square-sawn and planed in sawmills, thus perfecting the visual workmanship of the traditional Malay house. As a result, the symbolic placement of *tiang* according to their natural relationship and the 'one tree one house' concept has diminished due to the mechanical treatment of timbers in sawmills.

Moreover, it introduces another skill of Malay workmen in operating machines.⁶⁰ Though the Malay *tukang* has access to modern tools, the tools handed down for generations described previously remain the most important (Gibbs, 1988, p. 71)⁶¹. Access to modern tools reflects the development of machines in the Malay building process, however it contradicts the meticulous traditional practices of timber extraction and preparation from nearby forests, as most of the components can now be obtained readily on the market. In effect, the *tukang* have to adapt to the ever changing economic culture of the building industry, however attempts to assimilate both customs with contemporary practice can be seen in their resourcefulness in the creative adaptation of new materials.

In the age of mechanical production, Wright (1927) believed that architects must be the masters of the industrial means of their era.⁶² To produce architecture, machines are considered as 'tools' and thus architects (read: *tukang*) have to learn their nature by practice and

⁵⁹ A specific character of a Malay house with a protruding reception room and five-ridged roof.

⁶⁰ It is mentioned that the supply of squared timber and sawn planks were an exportable surplus in Malaysia in the 1800s, however the timber production was dominated by skilled Chinese sawyers and carpenters brought from China by the Colonial British to developed Malaya (Gullick, 2012, p. 82)

⁶¹ Traditional tools were said to be sacred and past *tukang* treat them with spiritual care.

⁶² The author does not attempt to simplify the term architect as equivalent to a *tukang*, however, an architect may have similar traits in the consideration of design and construction although the architect may not necessary build them.

eventually learn techniques to incorporate the ‘love of life’ into machines, to his advantage (Ibid, 1927). The ‘love of life’ suggested by Wright is similar to the notion commended by Lethaby (1930) where, ‘Art is the humanity put into workmanship, the rest is slavery,’ and therefore every work of art ought to demonstrate that it was made by one human for the other. It is in this understanding that Malay craftsmanship is said to describe the beauty of craft and the diligent workmanship of honest Malay *tukang*.

2.2.3 Rituals in the Building Process

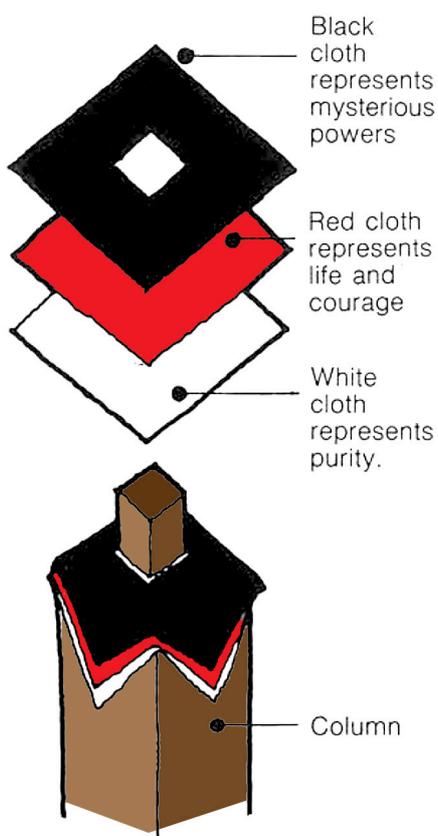


Figure 2.18 Bunga Halang is tied to the *Tiang Seri* as part of the symbolic and ritual meaning, before the structures are assembled. Source and edited: Lim, 1987.

As described by Gibbs, (1988, p. 14,63) one of the criteria for an auspicious house location is to find perfect soil⁶³. However, in general practice, the house is normally oriented to lie east-west to minimise heat gain from the sun and to accommodate Malay sleeping patterns.⁶⁴ Other practical considerations include the distance to work, water resources and the need to avoid flood-prone areas (Lim, 1987, p. 96). In the same way, the Malays believed that a house requires a *semangat Rumah* (soul of the house) – a force manifested as a mystical soul responsible for the well-being of occupants.

To induce the *semangat rumah* within the house, a few pieces of clothing called *Bunga Halang*⁶⁵, the size of one *jengkal*, are tied to the *tiang seri* (main post) together with a young coconut and a carved stick (Gibbs, 1988, p. 88; Lim, 1987, p. 100; Noone, 1948, p. 131). In addition, a silver or gold coin is placed underneath the *tiang seri* before erection as an offering as well as to ensure future wealth of occupants. While it is being planted, the *ibu rumah* will be asked to touch the *Tiang Seri* as a part of the ‘symbolic system’⁶⁶, as it will be her responsibility to care for the house, before the remaining structures are assembled step by step without delay. This procedure proves that the house is labour intensive

⁶³ The soil characteristics are described: ‘fragrant scented, yellow and green in colour, sweet in taste, low towards the east and high towards the west and other geomancy principles believed’

⁶⁴ The house is also perpendicular to the north south line, where the Malays were said to sleep with the head to the south (Noone, 1948, p. 130)

⁶⁵ The cloth is coloured in layers of white; purity, red; life and courage and black; mysterious power.

⁶⁶ Geertz (1973) stresses the aspect of ‘symbolic systems’ created by rituals to create ‘cultural patterns’ that ‘gives meaning’ and ‘objective form’ within a community.

and thus requires a collaborative effort led by a master *tukang*. The mother of the house is involved at all times during the process. More importantly, it requires a set of rituals that *tukang* or *pawang* have to conduct.

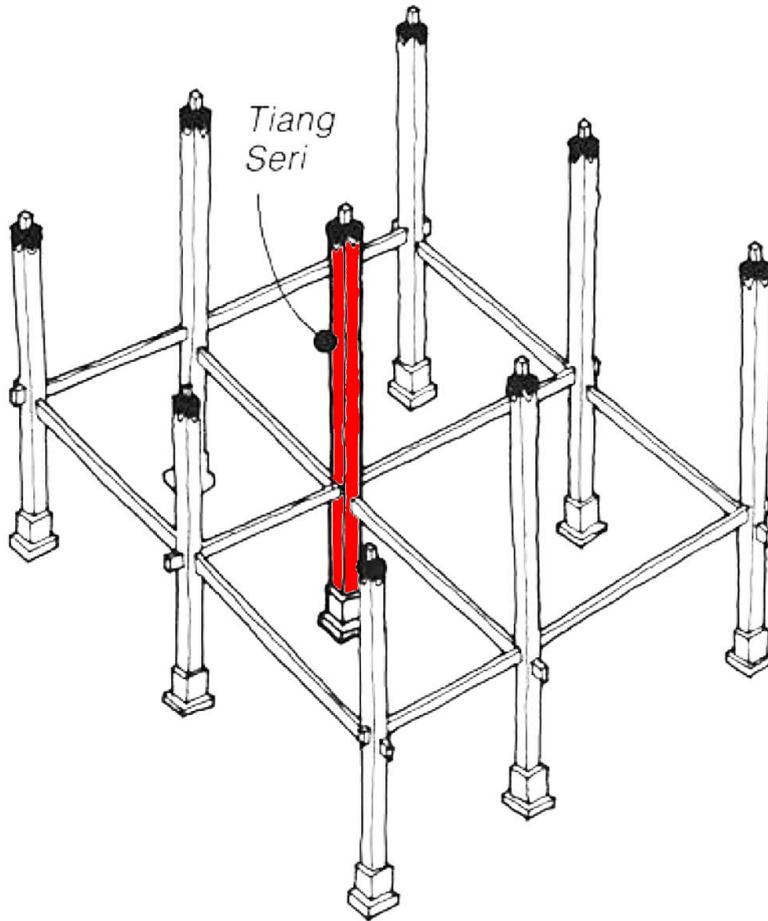


Figure 2.19 The *Tiang Seri* is normally located at the heart of structural distribution of Malay houses. Source and Edited: Lim, 1987.

According to the Oxford English Dictionary, ritual is defined as ‘a religious or solemn ceremony consisting of a series of actions performed according to a prescribed order’, ‘a prescribed order for performing a ritual ceremony’ and ‘a series of actions or type of behaviour regularly and invariably followed by someone.’ Kyriakidis (2007a) defines rituals as a ‘set [of] activities with a special (not-normal) intention-in-action, and which are specific to a group of people,’ hence they are culture specific.

Geertz (1973) argues that rituals (in beliefs or religions), are a combination of ethos and worldview, represented symbolically. Ethos is defined as the attitude towards the world and themselves – as aspirations of culture consisting of ‘values, evaluative methods (..)

assigned to human behaviour' (Counelis, 1984). Worldview is outlined as a conception of the world rooted in 'cognitive, existential aspects' of a culture (Geertz, 1973), therefore ethos is considered action while worldview is thought (Bell, 1992, p. 27). With regard to the Malays, Abdul Rahman (1999) defined the Malay ethos⁶⁷ in relation to the structural as well as spatial system of the house that reflects the Malay behaviour. Accordingly, the Malay worldview is layered in form as Malays were once Animist, Hindu, Buddhist and now Muslim, which may have been reflected in physical architectural forms.⁶⁸

In the literature of Malay rituals or Malay magic, there are two main references for most rituals mentioned earlier: the *Pawang's book* and the *Taj ul-Mulk*. Described by Ariffin (2000, p. 95), the *Pawang's Book* is written by Skeat⁶⁹ where he copied recorded rituals from the *pawang's* personal copy while the *Taj ul-Mulk* contains rituals on building procedures and other astrological and medical information. However, it is believed that the *Taj ul-Mulk* became one of the main sources of the *Pawang's book*, which nonetheless has many contradictory instructions due to differences in regional practices as well as the possibility of the flawed translation of the texts by scholars (Gibbs, 1988, pp. 57–58). This study will not attempt to analyze the instructions of the two books in detail or others, however, the content of the two books has influenced the knowledge of Malay *tukang* as their dexterity may have been dictated by the traditional belief system.

Ariffin (2000) identifies the term 'magic measurements'⁷ as the method to formulate the shape and form of traditional Malay houses. These are categorised into two aspects: to determine the omens of the house, and as construction measurements to regulate any significant linear dimension or position. Hence, the rationality of the measurements within a prescribed length is to seek harmony both with the spiritual

⁶⁷ Abdul Rahman (1999) refers to the term 'ethics' rather than 'ethos', however quoting a similar author but different source: Counelis, J.S. (1988) *Knowledge, Values and World-Views: A Framework for Synthesis - The Touch of Midas*, Sardar. Z. ed. Pelanduk Pub. Petaling Jaya.

⁶⁸ Malay structures are often represented through Hindu-Buddhist point of view of having the head (roof), body (living space) and legs (*kolong* or space underneath), however later on having to embrace Islamic cosmology (Abdul Rahman, 1999).

⁶⁹ Walter Skeat wrote the book on Malay Magic in 1900 and recorded the content of the Malay Rituals from a *Pawang* he met.

world and the technical requirements of Malay building culture. However, the rituals adopting magic measurements have faded with time. On the other hand, the myths accompanying the rituals may have survived in other forms.⁷⁰ Nevertheless, the rituals described in the assembly of Malay houses establish a close-knit relationship between 'primitive' Malays in the past and contemporary Malays.

Similar to rituals, with the coming of Islam Malays sought to worship a divine God through acts and observances, however as argued by Robertson Smith; religions in contrast 'did not exist for the sake of saving souls but for the preservation and welfare of the society.' Inevitably the belief systems or myths accompanying rituals are a form of knowledge⁷¹ in themselves (Robinson, 1990, p. 23). Hence Malay building culture and the rituals involved should also be viewed as a means for continuation of Malay values or knowledge creation in architecture rather than as customary actions meant only to favour the unseen. Dilley (2009, p. 58) explained this process:

'Through dreams and other forms of spirit intervention (ie. rituals), the weaver is linked through no obvious agency or activity to sources of knowledge, power and learning. The weaver becomes the vehicle through which knowledge creation works.'

2.3 Craftsmen and people who build

Anthropological and ethnographical studies on craftsmen (or craftswomen) throughout the world have been recorded and studied. Craftsmen are referred to as people who build and continue to practice vernacular techniques passed on from previous generations. Also known as artisans, builders or makers, they are typically confined by a social order of masters, learners, apprentices and journey craftsmen (or labourers) within an apprenticeship system often referred to as guilds in the west (Dilley, 2009; Marchand, 2012; Sennett, 2009). The creation of

⁷⁰ Bell (1997) quoted Harrison's work *Themis*, the relationship of rituals and myth: 'The original ritual activities tended to die out, while the accompanying myths continued independently in various forms' that could attach itself to specific historical figures and events or it could even be adopted as the pseudoscientific explanation of particular phenomenon'.

⁷¹

guilds characterised the apprenticeship-style of learning to promote and regulate craft and craftspeople, often as a means for social and economic advantage (Snell, 1996). These craftsmen conform to their local culture and belief, most of which are associated with the spiritual, folklore, myths and rituals (see: Blundell Jones, 2016). The belief systems of craftsmen are superseded but commonly assimilated with subsequent religious inferences (Dilley, 2009; Jones, 2016; Marchand, 2012).

The craftsmen's skills and knowledge in the past were communicated through oral transmission, as some cultures lacked written forms (Jones and Kong, 2016; Kong, 2016), others exercising antiphonal singing that conveyed their tradition, history, folklore, and moral beliefs to their offspring (Jones and Kong, 2016; Kong, 2016). Spoken words were accompanied with physical somatic actions, often conducted as collective tasks inside a community (Sennett, 2012), where these activities occurred within a situated context such as the workshop (Sennett, 2012) or the building site (Lave et al., 1991).

*“Adab is an expression to
conclude etiquette,
manners and thoughtfulness
- as being cultured”
- Helsminki, 2005*

Conversely there are parallel similarities to the aspects mentioned above with craftsmen and their building culture in Southeast Asia⁷², particularly in Malaysia, Indonesia and Thailand (Waterson, 1997). The practice of building vernacular buildings, normally domestic dwellings, are almost identical in most parts of this region (see; Ju, 2016), characterised by the anthropomorphism concept to a great extent, primarily depicted in the pile foundations, pitched-roof form and ventilated walls (Ju, 2016; Waterson, 1997). Furthermore, the timber-fabricated post and beam construction reflects the comparable skills and knowledge of local craftsmen with woodcraft, however the distinction lies in the meanings, culture, and rituals conducted. Generally the characteristics appear repetitive across different nationalities, however the techniques, doctrines and implications in building practice are diverse (See; Al-Ahmadi, 2000). While the Islamic influence may have been expected to diminish the mystical belief of craftsmen and other indigenous practitioners in Southeast Asia (Gibson, 1995), on the contrary, it has streamlined most of the rituals, reflected in other indigenous building practices beyond

⁷² See also; Waterson, R. (1998). The Austronesian house: Contemporary Models. In Chen, Voon Fee (Ed.) (1998). The Encyclopedia of Malaysia: Architecture (pp. 16-7). Kuala Lumpur: Editions Didier Millet.

building-culture or region⁷³ (Ammarell, 2002, p. 12; Farrer, 2008; Marchand, 2006, p. 47).

In this study, the Malay house builders within Peninsula Malaysia are defined as *tukang*. The Malay word *tukang* is translated into English as ‘craftsman’ or ‘artisan’ in a literal and limited description that does not express its deeper meaning reflecting Malay cultural values. Malay *tukang* are not only taught technical skills but also the moral and social consciousness that Malay society upholds. They are usually affiliated with values of vernacular architecture and non-linguistic forms of knowledge ‘formed through experience of, and practice in, the external world’ (Bloch, 2008) and eventually personifying the Malay concept of *adab*⁷⁴. This obligation leads to a deeper and mature understanding of both material and spiritual aspects in a building culture where strict Malay rituals are considered a necessary practice.

The Malay term *tukang* is also generally used to reflect mastery in different categories of expertise; wood *tukang*, steel *tukang* or stone *tukang*, adding a specific aspect of materiality, representing an accepted attribute that reflects the unique qualities pertinent to their function or status in Malay culture. This status is technically gained (ie. in skills and knowledge), validated and recognised publicly by his or her social comportment (Ariffin, 2001; Marchand, 2006). In this study, the term *tukang* is generalised to portray the expertise of a wood *tukang* while concurrently avoiding the term ‘carpenter’⁷⁵. The word *tukang* is more appropriate to connote the expression and the quality of a Malay master craftsman emphasising their role in traditional Malay house-building.

A ‘craftsman’ described by Sennet (2009) is associated with the notion of handmade, thinking skills, master-apprentice relationship, importance of

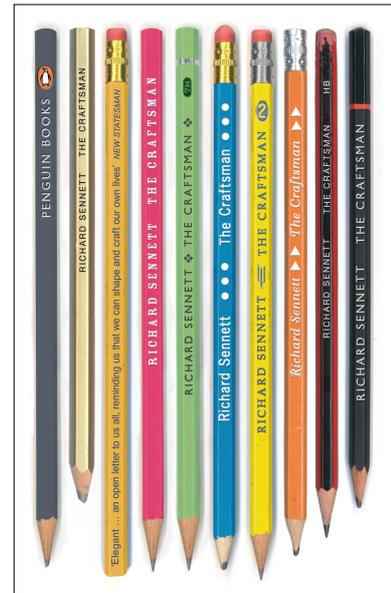


Figure 2.20 Richard Sennet’s *The Craftsmen* is an enlightening and provocative writings on the exploration of crafts or craftsmanship and ways thinking and making process converged. Source: www.Amazon.co.uk.

⁷³ The obvious one will be the utter of prayer *Bismillah* (In the name of Allah) prior to any tasks at hand. Any practices that relate to the aspect of making, in either building or smaller craft, is necessary to start and end by remembering God as the one who gave sustenance and intellect in doing such tasks.

⁷⁴ *Adab* simply refers to values, however according to Helsminki (2005) is an expression to conclude etiquette, manners and thoughtfulness - as being cultured. More importantly Helsminki described it as a ‘continuous process of refining one’s speech and actions’ that comes with a ‘natural, spontaneous beauty of character’ resulting from a lengthy and sensible transformation process. This could be said to represent the Malay outlook of *adab*.

⁷⁵ Refer to Section 1.1 (iii) for explanation and the comparison between the term *tukang* and carpenters.

the workshop, habits of practice-perfection, material consciousness and more. These concepts are among the list of a craftsman's qualities as described in the West, however the characteristics of a Malay craftsman have not been fully described in reference to his ability, habits, creativity and belief system in the building culture of a traditional Malay house. Taking a cue from Sennet (2009), a *tukang* could be defined within this study as one with proficiency in the knowledge and skills in building traditional Malay structures; deeply invested in the outcome and care to excel in his or her craftsmanship and workmanship.

2.3.4 Practice of *tukang*

*“...ritual is mysterious
in origin it is veiled in
operation...”*

In a passage of relevance to the *tukang*, Sennett argues that a ritual constitutes a type of craft, that ‘requires skills; it needs to be done right’ (2009, p. 12). He also suggests that though ritual is ‘mysterious in origin’ it is ‘veiled in operation’, in which he stresses the importance of it being persuasive – as in religions – demanding continuous repetition in a form of practice⁷⁶. Similarly, Ortner writes; ‘Ritual in fact is a form of practice’ (Ortner, 1984, p. 154). Borrowing from his definition of Practice Theory, a practice can be defined as ‘the relationship(s) (..) between human action, on the one hand, and some global entity which we call ‘the system’ on the other’ (Ortner, 1984, p. 148).

There are two main definitions of practice, (in reference to practice theory): the first is where an act is only comprehensible within a grounded system of a larger context, such as a culture (Sahlins, 1981). Here, the explanation of social phenomena is by means of social wholes or within ‘structures’ (Ryan, 1970). Secondly, sometimes the act of practice is ‘constructed by the actor themselves’ (Ortner, 1984, p. 150) - in this case the *tukang* – and it is therefore claimed that a social phenomenon or any occurrences such as in the traditional building practices within Malay society is explained by the portrayal of *tukang*'s individual acts and creativity. Nonetheless, Ortner (1984, p. 149) simplified practice as ‘anything people do’, but with emphasis on ‘those with intentional or unintentional political implications’ or ‘conscious strategies’ of the actor (Maggio, 2018, p. 43).

⁷⁶ In contrast, Tuan (1989) describes the process of tradition not out of the repetitive undertaking, however having ‘constraints’ in choices and selection in the performance of customs and practical norms.

Bourdieu (1977) describes the practice of craftsmen or *tukang* through the relationship between the human body as a medium engaging with its surroundings. He developed the term *habitus*⁷⁷, recognising the ‘agent’s practice, his or her capacity for invention and improvisation’ (Bourdieu, 1990, p. 13) and more importantly capturing ‘the permanent internalisation of the social order in the human body’ (Eriksen and Nielsen, 2001, p. 130). The mediation of the human body is explored by Bourdieu via a ‘dialectic of objectification and embodiment’, which according to Bell, ‘makes it the locus for the coordination of all levels of bodily, social and cosmological experience’ of the person’s action (Bell, 1992, p. 97).

As Bourdieu puts it, *Habitus* is a condition where the world’s structural constraints form ‘permanent dispositions’ or ‘bodily dispositions’ (Bourdieu, 1977). The key aspects here could be related to the *tukang* relationship with the Malay culture and beliefs that influence how they practice Malay house-buildings by adhering to a larger context than the material and site itself. Eventually, this relationship affects the *tukang’s* ‘schemes of perception and thought (...) [and] at a deeper level, (...) form of bodily postures and stances’ (Bourdieu, 1977, p. 15). It is also referring to the body *hexis*⁷⁸ presented by Bourdieu to explain how the social agents (actors or performers or *tukang*) physically ‘carry themselves’ in the world and eventually in practice (Jenkins, 2002, p. 75).

In short the practice of *tukang* is twofold: one is based on Malay cultural principles with that of his perception and acceptance of his surroundings. Another essential point is the emphasis on the *tukang’s* bodily movement and action, that becomes a physical gesture in his interaction with his practice, materiality and people surrounding him – the correlation is strong when describing the disassembly and assembly process within the Malay building culture.

⁷⁷ The term *habitus* was first introduced in the writings of Marcel Mauss to describe the cultural habits, acquired abilities and faculties of individuals in society. It is a way to describe where and how to formulate and understand practice.

⁷⁸ ‘Body *hexis* [a Greek word borrowed by Bourdieu] speaks directly to the motor function, in the form of a pattern of postures that is both individual and systematic’ (Bourdieu, 1977, p. 87).

2.3.1 Attributes of *tukang*

In the past, cooperative labour was commonly practiced in building Malay houses and consequently a tradition of building was strongly established where skills were handed down from one generation to another (Lim, 1987, p. 101). Though not everyone is considered a craftsmen or *tukang*, it was speculated that most of the ‘able-bodied males were once a *tukang*’ in some form or another (Abdul Rahman, 1999) as it was described of common Malay people in general:

“.. they (Malays) occupy themselves with mechanical arts to earn their livelihood; many of them are very accomplished craftsmen in carving and also alchemy, imparting fine temper to iron and steel for making arms.”⁷⁹

Marchand (2012) in his anthropological study of minaret builders in Yemen summarises that the definition in the quality and expert status of a ‘master’ are the inculcation of discipline, the resolute attitude of superiority (which set forth the hierarchy of ranks), and the skilled performances in both mind and action. Notwithstanding these definitions, in order to qualify as a master builder in Malay house-building culture, a person worthy of a Malay *tukang* quality is he who possesses four attributes; a *tukang* (craftsman), a *pawang* (shaman), *ketua adat* (Imam or person who leads religious ceremonies) and a carver (Abdul Rahman, 1999, p. 6). These attributes make his mastery in building traditional Malay architecture whole.

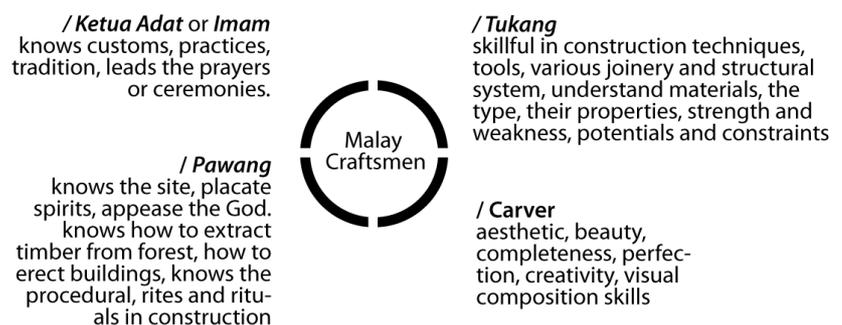


Figure 2.21 *Tukang*'s attributes according to Abdul Rahman (1999). Source: Author, 2014.

⁷⁹ Mentioned by a Portuguese official visiting Malacca, Emanuel Godhino de Eredia, as quoted by Alatas (1977,p.37).

According to Abdul Rahman (1999), as a *tukang* he has the construction and technical ability; he is expert in various joinery systems, proficient in traditional tools and in local materials. He also possesses the knowledge of a Malay house basic nine posts structural plan that distinguishes them from non-Malay types (Hilton, 1992, p. 41). Equally, the Malay *tukang* understands the Malay culture and the traditional model growth system⁸⁰ to accommodate changes within the spatial requirements of the house.

As a *pawang* (shaman), he is equipped with the knowledge of charms and rituals on building procedure that includes the selection of site, type of tree, to placate the spirits and appease the God. Generally, a *pawang* makes the rules of people within *kampung* (Wavell, 1965, p. 37). The Malays believed that the house requires a *semangat* mentioned earlier, which is presented within the main structure of the house called the *Tiang Seri* (main pillar). The main literary source of knowledge for a *pawang* is from *Taju ul-Mulk* (Ariffin, 2000).

As a *ketua adat* or Imam, is referring to the head of religion, customs and tradition of the Malay society pertaining to harmonious living. He is seen as a respected and prudent person leading the ceremonies and strictly acting to the process of *adab*, *adat* and *tertib*⁸¹ in the building procedure (Ariffin, 2000)⁸². An Imam is sometimes called to perform prayers for the blessings of a new house, before the occupant can occupy⁸³.

⁸⁰ Model growth system in the traditional Malay house relates to the additivity and subtrativity of spaces and form, usually from the core house: Mother's house or *Rumah ibu*. Spaces are added due to increase in the numbers of family members and subtracted due to the distribution of building components amongst family members to form part of a new house.

⁸¹ *Adab* is the assigned values to human behaviour or ethics, *adat* relates to customary building practices while *tertib* refers to the order or principle of the prescribe order in Malay house building. Hence an accomplished *tukang* could conduct all these values himself.

⁸² According to Ariffin (2000, p. 93), *adab* is the assigned values to human behaviour or ethics, *adat* relates to customary building practices while *tertib* refers to the order or principle of the prescribed order in Malay house-building.

⁸³ It is recorded that Muslim Yakan people of the Southwest Philippines in the Island of Basilan, have architectural styles and rituals conducted by an *Imam* that are similar to the Malays. Older traditions and rituals of pre-Islamic origin persist in union with the Islamic rites performed (Wulff, 1982).

Finally, as a carver he recognizes beauty as a 'symmetry with the nature' by expressing his creative visual composition skills unto the physical artefact (Said and Kamarudin, 2008). *Tukang's* carving ability is said to have a deeper association with his masterpieces (Lundberg, 2008) in the same way their attributes distinguished the creative abstract thinking, dexterity and appropriate skills required for the indigenous building craft.

However, with the attributes presented, a *tukang* could be seen as the 'jack of all trades' as what was recorded by Winstedt (1909) of a statement from a Malay chief:

"We Malays try all trades and are perfect at none. Each of us is herdsman, fisherman, hunter, boat-builder, carpenter as chance invites.."

The statement above questions the aspect of skills and knowledge pertinent for a Malay *tukang* and whether the attributes mentioned, share a common value or technical ability in their responsibilities. Or perhaps even to question its relevance in contemporary practice. Nonetheless, the attributes are easily perceived to favour towards the customs value as what is expected from the Malay societies.

2.3.2 *Tukang's* Dexterity

The term craft as in section 2.1.4 refers to an activity or the actions where skills are partly the main contribution. Meanwhile, craftsmanship is defined in The Oxford Dictionary as 'a skill in a particular craft; the quality of design and work shown in something made by hand' - which emphasises of mastery in practice and in the creation of the masterpieces. Similarly, a skill is defined as having 'particular ability to do something well', thus suggesting that the term craftsmanship refers to the proficiency of the 'maker' in his valued skills. In the area of Malay building craft, skills, particularly making skills, are important tools for a *tukang's* authority in his field, in opposition to the attitude of an 'expert' (Pallasmaa, 2009) or an architect (Marchand, 2012).

Creativity and tradition are intertwined and represent the complex processes of humans expressing themselves to others in ways that carry value and meaning. – Simon J Bronner

A craftsman or *tukang*, has skills of a particular craft, possesses the quality of work and the habit of problem solving thus resulting in excellence in his undertaking that provides value to the object created (Sennett, 2009). Furthermore, dexterity of a craftsman is based on years of experience in engagement and knowledge of his subject matter, hence it is considered as trained skills (Pallasma, 2009).

The definition of skill is further distinguished by the theme of a *tukang's* dexterity that echoes the traditional 'handmade' values of objects. The term handmade signifies the clumsy hand of a traditional designer (Wright, 1901) and thus signifies the nature of human variation, irregularity and flaws existing in craft (Sennett, 2009), which then defines a *tukang's* unique ability. Ufan (2010) defined 'handmade' as a role of creating physical intermediaries in the interval between the world and the self and therefore between Malay structures and the *tukang* and his skills. Despite this, 'craftsmanship' at present commonly refers to the values of the historical reminiscence rather than present. This is due to the perception of 'handmade' or 'hand-finished' becoming a superficial commercialisation in contemporary products to convince anxious consumers for the sake of profits (Frayling, 2011).

Skills are commonly associated with physical activities rather than theoretical ideas, however, Frayling (2011) defined craftsmanship as a 'combination of knowledge and dexterity' where thoughts cultivate the potential of skills. Pye's (1968) version of craftsmanship includes the element of thoughts, skills and attentiveness as quoted:

'[Craftsmanship] means simply workmanship using any kind of technique or apparatus, in which the quality of the result is not predetermined, but depends on the judgment, dexterity and care which the maker exercises as he works.'

While design is a highly sophisticated skill, initially it could be developed by attention to detail and naturally could be unconsciously performed by the state of mind (Lawson, 2006). Sennett (2009) described this as the power of imagination where knowledge can 'direct and guide bodily skills'. Here Sennett explains the quality of thinking skills as an eminent part in conducting *tukang's* physical actions in producing his



Figure 2.22 *Tukang* carving out a hilt of Keris using traditional handtools. Source: ©Tolahah Photography.

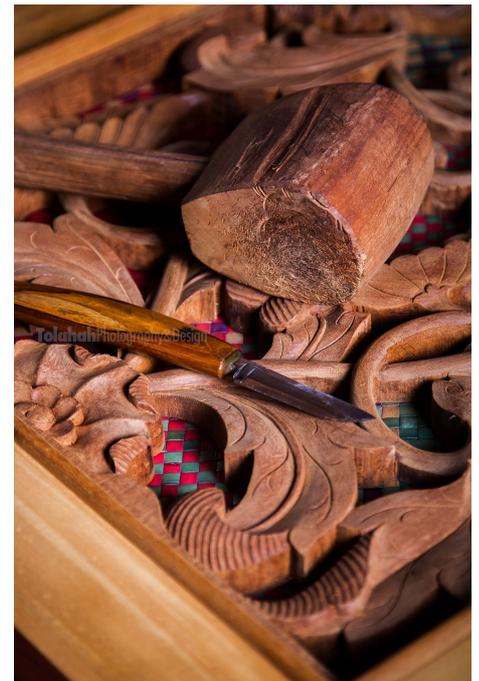


Figure 2.23 After the Islamic influence, Malay carvings usually illustrate the inspiration from flora as it was discouraged to depict the motifs of animals or other living creature, particularly on buildings. Source: ©Tolahah Photography.

craftsmanship. It is therefore important that a *tukang's* thinking skills are given similar attention to the physical.

Meanwhile, Whitehouse (1950) described craftsmanship not as the teachings of woodwork, but that which is based upon a 'conception of what is meant by beauty', consequently becoming an 'intellectual, physical and spiritual' instrument. Similarly explained by Adamson (2010), craftsmanship is a 'set of concerns that is implicated across any type of cultural production' and thus craftsmanship is generated by a desire to communicate cultural ideas (Stacey, 2012). This points out the intangibility element as the recipe for craftsmanship that is based on the thoughtfulness of *tukang*, which is implicated upon his Malay culture. Even in contemporary culture, although machine production could impersonate the work of the hands of craftsmen, artefacts have lost their initial value in manual dexterity and the capability to construct them (Zoran and Buechley, 2013, p. 6). Hence the definition of Malay craftsmanship, although ambiguous, may refer to the initial intent of *tukang* that is seemingly 'a great original interpreter of his time, his day, his age,'⁸⁴ and initially in his Malay cultural values.

2.3.3 Beliefs

Before Islam came into the Malay Archipelago, in particular where the Peninsular Malaysia is now, the Malays embraced their indigenous doctrines such as animism, Buddhism and Hinduism. Frank Swettenham described among the many Malay characteristics to, "[V]enerates his ancient customs and tradition, (..) and has a proper respect for constituted authority."⁸⁵ Likewise, Abdul Rahman (1999) believed that all Malay *tukang* were devout, and like any member of Malay society, conformed to the traditions of Malay doctrines. Furthermore, he concluded that the Malay *tukang* played a significant role in Malay architectural practices, while always in harmony with the collective spirit of Malay society (Ibid, 1999).

⁸⁴ Wright, F.L., 1953. The future of architecture. Horizon Press. Although Wright may have referred this to an architect, but the reason seems to be valid due to the nature in which *tukang's* work and responsibility is comparable to architects.

⁸⁵ Frank Swettenham was the first Resident General of the Federated Malay States. His description of the Malays was quoted from Alatas (1977, p.44).

The spiritual world is significant to past Malay culture, therefore most craftsmen possess special knowledge in order to appease the spirits. Dilley (2009, p. 53) uses the term 'knowledge-power' in contrast to 'lore' to describe this special knowledge, 'for it is both a body of learning and a form of agency that results in effects being brought about by means of that learning' through dreams and encounters with spirits. Meanwhile the term 'power-practices' were used to describe actions accompanying it; from the 'practical manifestation of particular specialized skills and talents to a set of practices that are considered to draw on often invisible, non-human, spiritual agents' (Dilley, 2009, p. 53-54). For most parts of the Malay world, the spirits are derived from the everyday, the surrounding environment and the earth.

In the same way, the natural tropical settings of 'floral, fauna and cosmic forces become the source of inspiration' and was a response to the animistic beliefs that were 'depicted in abstract or stylized form' of carvings embedded within the traditional Malay house (Said, 2002, p. 44). Said adds, after the influence of Islamic philosophies, calligraphic and geometric forms were used as motifs in woodcarving to replace symbolic pictorial depictions of creatures or animals, as an evolutionary way of amalgamating Islamic civilisation within Malay culture (Ibid, 2002).

Similarly, the teachings of Islam influenced the rituals conducted by a *pawang*. Parts of Islamic scripture and concepts in the Quran were embraced⁸⁶, and thanks was given to God. The rituals performed by a *pawang* were shared by the *Imam* or *lebai* (religious authority) of the mosque (Gullick, 1987, p. 182), however a *pawang's* work was normally considered taboo and superstitious⁸⁷. Nevertheless, there was no mention of changes to the building method or structural arrangements of the traditional Malay house as a result of the introduction of Islamic teachings, apart from an adjustment in building orientation to face

⁸⁶ This phenomenon can also be found on Craftsmen in Senegal and other parts of Africa where traditional lore and Islamic knowledge are put together. See; Dilley, 2009.

⁸⁷ Ortner (1995, p. 356) describes a similar occurrence in Nepal where shamans or rituals specialists were put out of business due to the rise of religious establishments. Shaman works were considered as 'unreliable, ineffective and sinful'.

Mecca.⁸⁸ This may suggest that Malay *tukang* settled on the structural and procedural aspects of a traditional build that reflects the constraints and needs of its occupants beyond its associated religious factors.

2.3.4 Material Consciousness

In the study of poetry, craftsmanship is distinguished from the notion of inspiration - in a sense, 'experience' or 'suffering' that helps poets to form better images and to compose beautiful pictures and subjects (Yousif Abid, 2005). Similarly it is therefore crucial for *tukang* to familiarize themselves and engage closely with the subject of their craft. In her book, Moore (1976) described the position of the craftsman as a 'participator' in the process of making which supersedes the importance of the end results. While the statement is contradictory to the nature of contemporary architecture as a form-driven practice, craftsmanship has direct affection with the development of making where 'craftsmanship is synonymous with material' (Yanagi, 1989). This process is clearly described by Sennett as 'material consciousness' in his book *The Craftsman* (2009).

Common "primitive" understanding of craftsmanship is expressed as an 'awareness' of a material, and the 'sensitivity' of its use (Riegger, 1972) signifies material importance in thoughtful making. In the process of design, the form constantly evolves and is conceived in the maker's mind (Eames and Wildenhain, 1957), and is simply 'impressed upon the materials' (Graves-Brown, 2000).

In building the Malay houses, timber becomes the primary material used and therefore the notion of consciousness revolves around the making techniques of wood. Materiality of wood insinuates concerns pertaining to their durability limitations and structural strengths, relating to Heidegger's idea of the 'material-semiotic-actor' (Bolt, 2007), where material actively contributes to the production of design. However, as the Malays were sometimes superstitious, awareness and sensitivity in materiality go beyond its physical substance. This leads to excellence in every aspect of the building culture, physically and spiritually.

⁸⁸ Muslims pray 5 times a day and must face Mecca when praying. Since the common practice is to orientate the building west-east, the orientation towards Mecca requires a slight re-alignment towards the north-west orientation. This could be done by lifting the house and reorienting it accordingly.

2.3.5 Practice, Perfection and Control

Tukang have produced wonderful craftsmanship by commitment to quality and perfection in work commonly expressed through ‘succeeding generations’ (Wallance, 2010). Perfection of work is inherent to the *tukang’s* definition of aesthetics; in contrast to Muthesius’ expression that, ‘aesthetic judgement is built upon prejudice; habit is its midwife’ (2010). This is justified by Whitehouse (1950) where values of craftsmanship are held to be similar to the values of ‘sincerity’; or work being undertaken to the best of one’s efforts. To that end, a *tukang’s* familiarity of habit such as in problem solving forms part of the value of an object (Sennett, 2009).

In addition, the constant habit of a *tukang* results in the ability to take command of the thoughts and techniques of craftsmanship defined by Frayling (2011) as a ‘measure of control (..) exercised over their (*tukang*) work’. For example, the 10,000 hour rule suggests that continuous practice of a certain task creates talent or skills as ‘achievement is talent plus preparation’ (Gladwell, 2009). Hence, craftsmanship in building Malay houses demands skills that if practised, make *tukang* superior in both creativity and routine; following the principle of ‘pleasure and exuberance’ (Frye, 2006) which associates the arts, the mind, and the constant and rigorous rules of a master *tukang*. Concerning architecture, an architect could be described as ‘a superb craftsman’⁸⁹ due to his masterpieces but more importantly his ambition for perfection (Eames and Wildenhain, 1957).

⁸⁹ The late Peter Blundell-Jones, a Professor of Architecture at the University of Sheffield, opposed this stature of architects as craftsmen in his remarks for this study’s confirmation review in 2013. This is due to his opinion that in contemporary practice, architects neither build nor have physical contribution in the construction. Nevertheless, the study is of the opinion that this statement is relevant to describe the nature of the *tukang’s* responsibility akin to an architect as well as the dual characteristics of craftsmanship or craft: physical excellence, while the other is the *tukang’s* thoughtfulness.

2.3.7 Labour arrangements

“...work done within the kampung, it was not conceived based on capitalism mindset but merely honest work that may happen at odd times”

Malay peasants adhered to a non-European style of working⁹⁰, hence could similarly be said for a *tukang*'s way of work. In general, past Malays' work was associated with the term '*kais pagi makan pagi, kais petang makan petang*'. It literally means that the work was done partly for the day with no intention for it to benefit the next, not for the sake of idleness but due to the nature of the Malay socio-economic system. The concept of 'accumulated surplus' in the work completed did not exist (Alatas, 1977) as the Malays do not share the values and importance of money and property of the Europeans nor the conditions worthwhile to work hard only for accumulation of wages (Firth, 1943, p. 141). However, the Malay labourers proved to be capable of a 'sustained, skillful and energetic labour' (Ibid, 1943, p. 141) even to the extent of submitting themselves to corvée labour described as *kerah*⁹¹.

Perhaps, the values in the Malay work conditions resonate with the aspect of '*Joy in Labour*' within the Arts and Crafts movement described by Crawford (1997). It suggests that joy in workmanship was as a result of encouragement for the ordinary or mundane experiences in work considered as a source of pleasure and creative freedom among the Malay people. For example, the love and joy of Malay house-building possibly symbolises the quality and commitment of a civilisation at that particular period, which, 'for love of it made them live' (Wright, 1927).

In the case of building the Malay house, it was more of a craft rather than a profession as in the past, the basic unit of production or work was the family, with productive contributions from family and friends (Strange, 1981, p. 138). It was not until the 1870s that the term contractor or 'builder' in Malaysia was introduced; to describe a small-scale Malay entrepreneur who built houses from the tradition of his community into a successful trade (2012, p. 81). From stories told,

⁹⁰ Hourly paid and that requires a period of absence from work to relax the mind, which is known as a holiday. See; Alatas, 1977.

⁹¹ *Kerah* is a type of unpaid forced labour that is compulsory to all Malay peasants under the decree of the Sultan or Raja. It is usually conducted as a *gotong-royong* (mutual assistance) in order to achieve something beneficial to the many.

before the 1870s, a Malay house known as *kutai* house in the state of Perak was built in payments of two buffalos⁹² (Nasir, 1985, p. 82).



Figure 2.24 A Malay peasant attending to his gang of buffalos. Source: ©Dallah Deen

Typically, the labour of traditional *tukang* (akin to apprenticeship-style of learning) may come from within the lineage of family, hence the bonds in the group as well as the work tend to be genuine and deeply attached (Marchand, 1999, p. 84). As a result, the responsibility, skill-sets and knowledge in house-building revolves around the family and within the *kampung* threshold. On the contrary, while a *tukang* proficient in one type of house (ie. Terengganu house or Perak *kutai* house) was said to be incompetent in building other types (Nasir, 1985, p. 82), some suggested otherwise. There is evidence of occasions when an owner has employed *tukang* and materials from other regions (Ariffin, 2001, p.51), suggesting a collective and generally accepted system in house-building shared among Malay craftsmen.

The term 'regular work' fits better with *tukang* jobs in traditional society. For survival, the Malays attend to additional odd work and seasonal activities such as fishing and planting rice and fruit, providing them alternatives to resources and other basic needs (Firth, 1943). This also occurs within the community of masons in Djenne (Marchand, 2009).

⁹² Nasir (1985) explained that a medium sized buffalo costs around thirty Ringgit each. Perhaps, he adds, the Ringgit used is of 'Spanish Ringgit,' which was commonly used then.

However, at present, the capitalist system suppresses unconventional economies, with the concept of money offered as the only solution. In contrast to the work done within the *kampung*, it was not conceived based on capitalism mindset but merely honest work that may happen at odd times⁹³. The concept also appeals to the Quran and the life of the Islamic prophet, which was summoned as: ‘whoever does not earn his living by the means of his own skills or manual labour is not the friend of God’ (Alatas, 1970, pp. 290-291). Similar to what Jeremy Till has advocated⁹⁴ as the concept of ‘time banks’ - which is in part a response to the post-capitalist system – there seems to be a similarity in the common practice of past Malay people and other traditional societies within their own economic endeavour.



Figure 2.25 Gotong-royong in relocating the Malay house. Source: Bailey, 1983.

Despite this, we regularly see that the concept of time refers to the daily prayers Malay Muslims obey where early *Fajr* resonates with waking up before sunrise to work. It is after hours of morning work that *Zuhur* takes over to remind of the mid-day meal and afternoon rest before continuing work till *Asr* for teatime, a few hours before arriving home and before *Maghrib* during dusk⁹⁵. This is a common shared schedule⁹⁶ for most of traditional Malay society and other parts of the Muslim world (see also: Ammarell, 2002 and Marchand, 2012) even today.

Another essential point in the practice of labour was the collective effort of the *tukang*, his apprentices and community (Marchand, 2006; Mohamad Rasdi et al., 2005; Sennett, 2012). The importance of collaboration among crafts people was about sharing the difficulties described by Yanagi (1989): ‘individualism guarantees no beauty, nor

⁹³ The Malay peasants or *tukang* working in rural areas could have been more honest than their city merchants in the city, where larger trading occurs. In general, city merchants were said to be susceptible to dishonesty, owing to their way of earning a living. (See Ibn Khaldun’s ‘The Muqaddimah: An Introduction to History’)

⁹⁴ Jeremy Till presented the concept at his talk entitled: ‘*If Spatialising Capital is the Answer, What is the Question?*’ at the University of Sheffield 5th May 2016.

⁹⁵ *Fajr*, *Zuhur*, *Asr*, *Maghrib* and including *Isya’* are prayer times adhered to by the people of the Islamic faith, where it coincides with the cycle of the sun throughout the day.

⁹⁶ It is especially relevant for Malay paddy planters that requires highly physical work over large areas of land, where rests helps them to rejuvenate. This also affects the way work is prioritised with religious obligations that produces god-fearing *tukang* (honesty is one of main traits demanded in Islam) whose workmanship is focused on producing a perfect outcome.

does it even provide the requisite ease in technique'. In the same way, the Arts and Crafts movement view the collective experience for craftsmanship to flourish, to the level of, 'reified principle, higher and broader than individual makers' (Cardoso, 2010, p. 330). While the construction of buildings requires an industry of 'skilled cooperation' (Richard Sennett on Art and Craft, 2013; Sennett, 2012) or 'collaborative craftsmanship' (Pallasmaa, 2009), building Malay houses benefits from the process of *gotong-royong* (mutual help) among the Malay communities, generally within the same *kampung*.

The concept of *gotong-royong* is akin to *tolong-menolong* (help), but made systematic by the concept of *pinjam orang* (borrowing people), a mode of reciprocal exchange of labour (Bailey, 1983, p. 80,189). The *Pinjam orang* mode of labour was possible in the past due to the seasonal activities relating to house-building or house moving, allowing flexibility in time and mobility in alternative employment. Although organised and structured⁹⁷, the work done through *pinjam orang* was an act of general consensus in social responsibility, where the payment was usually in a form of food (ibid, 1983, p. 190). Unfortunately, there is a loss in the activity of *gotong-royong* labour in building Malay structures, especially in the interior of Malaysia (Alatas, 1977, p. 199).

Gotong-Royong narrates the participatory culture⁹⁸ or 'cultures of participation' (Fischer, 2011) as a shift from a focus on individual expression to a civic or community engagement. It is a process where one acknowledges, supports and changes how we think of others and ourselves. In participatory culture, while everyone feels socially connected and a sense of belonging⁹⁹, 'not every member must contribute, but all must believe they are free to contribute when ready, and that what they contribute will be appropriately valued.' (Jenkins et al., 2009, p. 7). Even though master *tukang* play a dominant role within

⁹⁷ An interesting note is that the concept of *pinjam orang* was organised by a person called the *ketua pinjam* (head of borrow) acting as the coordinator and enforcer of mobilizing labourers (Bailey, 1983, p. 189).

⁹⁸ Although participatory culture refers to the current production or creation of published digital content in the modern world, the author posits that the labour arrangement in *gotong-royong* reflects the idea that negotiation in the creative expressions of individuals within the community occurs. While it is not stored 'digitally', it is embodied in the practices and instilled in cognitive thoughts.

⁹⁹ See; Shirky, C., 2009. Here Comes Everybody: How Change Happens when People Come Together. Penguin UK.

the Malay house-building process, the contributions of the people involved comes in multiple forms of motivation and levels of expertise. Participatory culture affords 'strong incentives for creative expression and active participation' (Jenkins et al., 2006, p. 7). Eventually, it is not just about building Malay houses but it is a manifestation of diverse possibilities in the expressions, affiliations and collaborations (Jenkins et al., 2006) among building participants, perhaps more importantly in the way skills and knowledge are learnt and transmitted.

2.4 Apprenticeships, skills and knowledge

Skills and knowledge in this study generally refers to the dissemination and transmission of Malay knowledge, information and skills in Malay building culture, from one individual to the other, often through an apprenticeship style of learning. It is not limited to a theoretical or practical understanding of a Malay building process but expands to experience and justified belief that seeks to organize, distribute, pass on, create and capture for future generations to embrace. In Malay building culture, the tradition of transmission of skills and knowledge through generations has fortified the continuity of Malay house architecture, partly due to the traditions, customs and belief that Malay communities hold fast and continues to practice (Nasir and Wan Teh, 2011, p. 11). Furthermore, it is important to remember that the transmission process in the past relies on the oral tradition and practice of culture rather than through artefacts or buildings (Oliver, 1997).

Indigenous knowledge is referred to as 'matured-long-standing traditions and practices of certain regional, indigenous, or local communities' (Soh and Omar, 2012, p. 603). It embraces the teachings and wisdom of certain communities in a form of 'folklore artefacts' such as tales, proverbs, stories, legends, songs and jokes (Ibid, 2012). Indigenous knowledge is not taught in a formal school curriculum or studied in the fine arts. Instead these traditions are passed along informally from one individual to another either through verbal instruction or demonstration.

Knowledge transfer is defined by Argote and Ingram (2000, p. 151) as the process where one unit (e.g., group, department, or division) is affected by the thoughts and experience of another. They posited that knowledge transfer is quantifiable by measuring changes in knowledge

or performance of individuals (Ibid, 2000). Similarly, Nonaka and Takeuchi (1995) termed the phrase 'knowledge creation' in regard to the capabilities of companies to create knowledge, disseminate and embed knowledge into products, services and systems. While the terminology differs as one emphasized on 'transfer' and the other 'creation', both definitions present how knowledge has an impact on innovations as well as individuals.

Argote and Ingram (2000) further described the framework of knowledge transfer to encompass three basic elements such as members, tools, and tasks. Members could resemble the individual *tukang* or apprentices, tools as building apparatus or methods (ie, chisels, equipment) and tasks reflect the culture or customs, intentions and purposes within the building culture. Skills and knowledge are embedded within these elements and though they are complex, by facilitating the flow and reproduction of skills and knowledge, transfer could be successfully established. This can be further improved by combining the elements together to form networks of knowledge mediums that simplify the transfer from one unit to the other (Ibid, 2000).

Although the main description of knowledge transfer by both definitions is derived from an organisational structure, it is relevant at an individual or personal level. More important is to highlight the significance of an individual character such as the master *tukang* who makes a significant contribution towards knowledge being passed down to others. Individual members such as master *tukang* constitute one of the 'repositories' for knowledge in any organizations and among other repositories: organizations' structures, operating procedures, practices and culture (Walsh and Ungson, 1991). Similarly, Singley and Anderson (1989, p. 1) defines knowledge transfer at a personal level (such as for *tukang*) as, 'how knowledge acquired in one situation applies (or fails to apply) to another', suggesting that making individual knowledge or skills available to others, continuously and at all levels is the central concept in transfer within community organisations (Nonaka, 2007).

2.4.1 Tacit and Explicit Knowledge

Although knowledge transfers at an individual level appear straightforward, they can potentially transcend the individual's technical

ability in the skills or craft that are based on experiential knowledge or 'know-how' (Nonaka and Takeuchi, 1995) particularly in relation to the *tukang's* expertise. However, these spatial and perceptual-motor skills are hard to articulate in technical terms nor spoken words (Aiman et al., 2015; Ariffin, 2001, p. 101; Marchand, 1999; Wood, 2009a, p. 176). Although there is a possibility in verbalizing tacit actions, there is always a risk for the intended knowledge to change character.¹⁰⁰

According to Wood (2009), to obtain information and feedback from craftsman requires a hierarchy of individuals. By having an experienced novice or apprentices of an 'expert learner', tacit knowledge could easily transfer between the master craftsman with others (i.e. the apprentices, learner or students). The 'expert learner' becomes the mediator between the intuitions of a craftsman into a more understandable concept of workmanship acted upon the actions taking place. However, in Malay apprenticeships at present, the 'expert learner' is non-existent and thus questions ways knowledge is potentially transmitted within the building culture at present.

As past Malay building culture relies on oral and practice transmission, it is speculated that the building process, including procedures and rituals provides the means where skills and knowledge are passed down. The house becomes 'a repository of cultural memory, rather than just a skilful arrangement of posts and beams' (Fox, 2011, p. 148). The *gotong-royong* facilitates this collective transmission where everyone in the community voluntarily lend their time and energy to assist (Ariffin, 2001, p. 42; Gullick, 1987, p. 183). Everyone learns, observes and talks about the building being disassembled and assembled at that particular moment, while a *tukang* or old members will demonstrate the building culture in a more practical sense (Ariffin, 2011, p. 42). Though the learning activity occurs informally, Lave et. al (1991) emphasises that in order to organise knowledge within a 'community of practice' it is necessary for 'transmission' to include learning and teaching activity, similar to the apprenticeship-style of learning. Meanwhile, the social interactions and surrounding activities within the environment, as well as materials and tools available helps to structure and transpire the knowledge transmitted (Lave et. al, 1991).

¹⁰⁰ Bloch, M.E.F., 2008. How We Think They Think: Anthropological Approaches To Cognition, Memory, And Literacy. Westview Press. See page 7.

Subsequently, the technical and the cognitive aspects of individual knowledge leads to the categorisation of knowledge as either tacit and explicit¹⁰¹. The creation, process and organising tacit knowledge is done in the unconscious mind commonly fuelled by emotions, values and ideals gained by the use of symbols or metaphor, which is often lacking in architectural research at present (Robinson, 1990). Tacit knowledge based on technical and cognitive dimensions are mainly based on experiences not stored in a logical or systematic manner, thus requiring conversion into words or numbers in order to be reproduced and disseminated to others (See; Woods, 2009). Codification or capturing tacit knowledge is a challenge¹⁰² and while many have attempted to develop models to translate tacit knowledge to explicit (Nonaka, 2007; Nonaka and Takeuchi, 1995; Wood, 2014, 2009b), a 'community of practice' (Lave et. al, 1991) could hypothetically solve both of these issues.

Similarly, traditional knowledge in a building culture could distinguish between 'strategic or technical knowledge' and 'a deep understanding of cultural matters, of ritual and of tradition' (Fox, 2011, pp. 147–148) – corresponding to the explicit and tacit knowledge. The strategic or technical knowledge requires 'planning, construction and fabrication (..) based on a specialised knowledge of measurements and proportions,' which is the ability to organise a complex arrangements of building parts (Ibid, 2011, p.148). 'A portion of the knowledge about the house is vested in a critically important narrative that is intended to explain the origin of the house,' (Ibid, 2011, p.148) hence the knowledge of ritual or tradition is comprehending the basis of its ritual performance, embodied culture and symbolic meaning.

In the case of Malay building culture, tacit knowledge denotes the know-how and practices (or rituals) in house-building while the explicit refers to the performance and the physical artefact of the Malay house itself. Robinson (1990) posits that in architecture, neither tacit nor explicit (as

¹⁰¹ Refer section 2.1.3 on the Poetics of the Malay architecture where the tacit and explicit knowledge are likely to relate with the concept of immaterial and material, unmeasureable and measureable and intangible and tangible.

¹⁰² Davenport, Thomas H.; Prusak, Lawrence, 2000. Working knowledge. How organizations manage what they know, 2nd Edition. Cambridge, Massachusetts: Harvard Business School Press.

in myth) could communicate effectively without the emotional content that seeks to explain it. Hence cognition without the emotions intuited by the knowledge bearer and the receiver, prevents a 'craftsmanlike approach to buildings' (Robinson, 1990, p. 30) such as the craft of Malay house-building.

2.4.2 Artefacts and Masterpieces

The study of the history of buildings such as the traditional Malay house is prerequisite to its preservation. In the West, the preservation of buildings benefits from the pictorial evidence completed prior to construction, described by Kostof (1985, p. 3) as 'formal' or 'abstract' images such as plans and elevations from the architect. Eventually these drawings if preserved well, which in most instances 'were proceeded with dozens of sketches and diagrams' could 'help document the very process of design' of a particular building. In contrast, the traditional Malay architecture lacks such forms of representation – hence could be said to rely on the experience of the house builder and others involved in building them.

"We are very far from the factory and the workshop, the noise and dust, tiredness and sweat, (...) [which] contribute to the technologies history,"
- Paul Rasse, 1991

Traditional Malay house blueprints are non-existent as traditional builders rely on their memory, intuition and bodily skills. The case with Rudinara house in Malaysia, the master *tukang* was described to mark down building details on a matchbox (Salinger, 2007), hence portraying the lack of intent in permanent or official documentation¹⁰³ but the importance of the *tukang's* experiences. As a result in the absence of *tukang* or the house builder, the study speculates that Malay house-building culture could rely on physical artefacts that are still standing as a readily and only source of 'blueprints' available. A recent study on a Malay house is a perfect example where an existing Malay structure is carefully examined in order to understand its socio-cultural and environmental values (Ghaffarian Hoseini et al., 2014). Similarly other research examined the common and often considered meaningless burn

¹⁰³ While most of architectural heritage of Malaysia was outlined as sketches represented by an artist's impression, the first house recorded by a quasi-professional in Malaysia was by Syed Zin to build a residency for the British residents in the state of Selangor (Gullick, 2012). He was commissioned to build a residency for the British residents in the state of Selangor (Ibid, 2012), and therefore formal blueprint of houses in Malaysia was undertaken which was absent prior to this.

marks found on traditional timber houses in order to speculate about the practices, socio-economical and religious rituals conducted in the past (Dean and Hill, 2014). Robinson explains this perspective with emotional implications:

'Architecture, when understood as a medium, is unavoidably a didactic statement of how a given society ought to live, think, and/or feel (thus a cathedral explicates the presence of god or a school expresses and dictates the Western notion of what is appropriate education)..'

Subsequently, the design and materials of the Malay houses were described by Harun (2011, p.45) to portray evidence of technique and knowledge of a Malay building culture, matured through time. It is in these techniques, in particular the *tanggam* system that these houses are still standing until today although they are often kept as museum displays that could only be understood by *tukang* who made them or the museum curator. Laroche (2006) postulates that objects could be understood by its technical point of view, which in relation to the Malay house could be from the *tanggam* system itself. Though to familiarise the technical concepts 'can be difficult and highly delicate', it is the technical process in which an object operates or is made that emphasises the object's image and character (Ibid, 2006), renders it to be meaningful.

However, an artefact can only be understood from its 'core method' relating to a particular object - as a specific means of 'seeing and thinking'¹⁰⁴. In the instance of the Malay house, it is the process of building it from initial intent until it is occupied. In particular, the disassembly and assembly process is described in the beginning as an important aspect that defines this building culture. Essentially it is also the technique used in the conservation process, and is thus relevant in relation to the existing Malay houses, which could potentially be seen as physical blueprints.

¹⁰⁴ 'Core-method' refers to the craft tradition that identify the 'essential principles and rationales' in the approach used in practice. Although this example explicitly presents excavation activity in an archaeological practice, it does contribute towards the aspect of understanding an artefact in creating 'confound or surprise, forcing modification of schemes of interpretation'

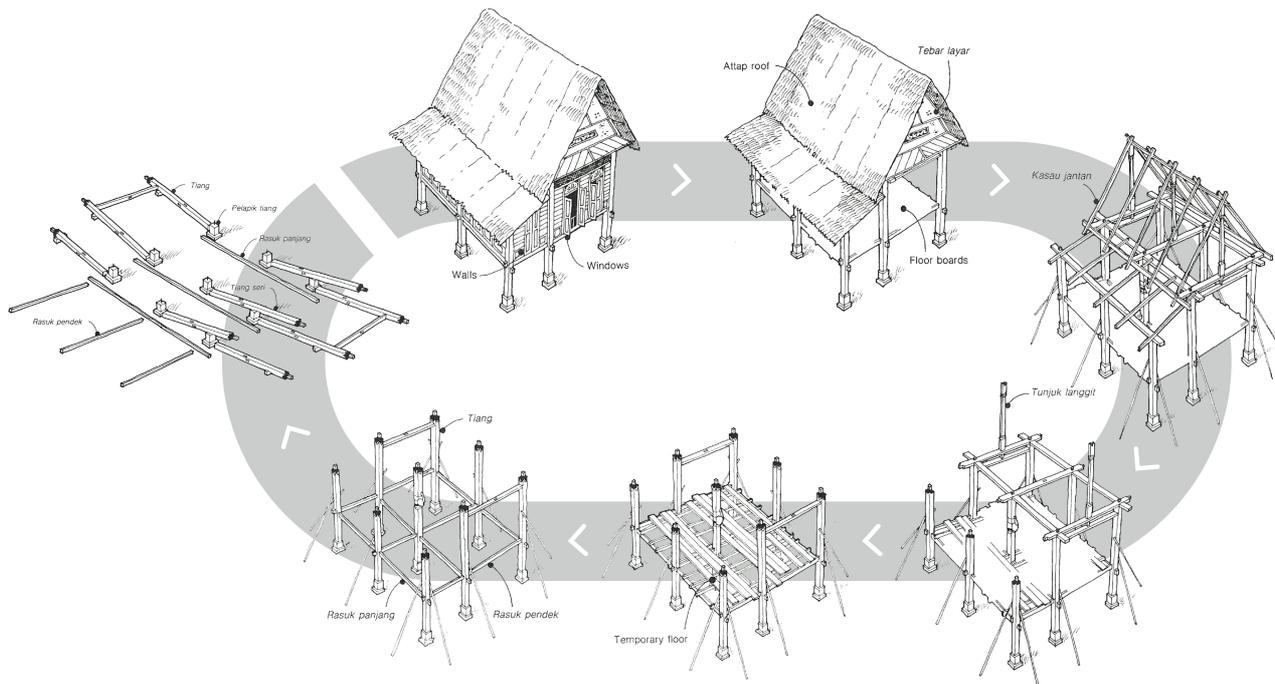


Figure 2.26 The disassembly and assembly process within the Malay house. Sourced and edited from Lim, 1987

2.4.3 Apprenticeships

Michael Coy (1989, p. 1) introduces a general notion of apprenticeship as follows:

'Apprenticeship is a complex and multi-faceted concept. It clearly involves education, social relations, and economics, and it suggests an ideology of life and work associated with a specialized role. Apprenticeship involves at least two persons and probably many more than two. The two principles are a person possessing specialized skills and a person who wishes to acquire and develop those skills for him/herself. Apprenticeship thus consists of a social relationship. And, inasmuch as the specialized skills sought by the apprentice are often, perhaps always, valuable, apprenticeship has an economic dimension.'

Apprenticeship here is seen in reference to the experiences in 'ways of knowing' or 'learning to see' (Coy, 1989, p.2), 'via the dynamic and responsive transmission of skill-based knowledge from one generation of builders to the next' (Marchand, 2006, p. 47). The nature of apprenticeship of builders reflects the physical 'process of making' in

contrast to an architect's expertise¹⁰⁵ (Marchand, 2012). More importantly, it involves embodied skill-based knowledge that emerges within an established context of a building site (Lave et al., 1991) or a workshop (Sennet, 2012). Earlier notions of apprenticeship refer to small-scale domestic craft production, initially 'a means of control over the family lineage, wealth and power' (Snell, 1996, p.305). This explains why past apprenticeships often took the form of 'sitting-in' and the apprentice was naturally a member of the master's family, which also explains the substance of learning extending beyond craft to moral and life values.¹⁰⁶ (Ibid, 1996). This general description of apprenticeships could be said to be reflected within the Malay house-building teaching-learning relationship.

Traditionally, a craftsman is bounded by a hierarchy of labour between a master craftsman and his or her apprentices (Dilley, 2009; Marchand, 1999, 2006; *Richard Sennett on Art and Craft*, 2013). In between lies a 'journey' craftsman in search of a niche in craftsmanship, skills and knowledge (Sennett, 2009). This narrative speaks of a relationship between a principal architect or designer with an assistant, but in the hierarchy of Malay building culture, the master *tukang* or *tukang tuo*¹⁰⁷ is a principal, while others are either apprentices or journey *tukang* or labourers. The relationship is by 'expressive instructions' (Sennett, 2009) where apprentices yield their obedience and respect¹⁰⁸ in exchange to the vocational training given by the masters (Marchand, 1999, 2006). In some instances, a good apprentice has responsibility to organise and strategise their own learning process in order to seize as much access within their practice from the masters.¹⁰⁹

¹⁰⁵ Marchand compared the mastery of craftsmen or artisans to the training of 'architects' in their 'mastery of space'.

¹⁰⁶ Snell (1996) described that, 'almost any apprenticeship (...) [had] involved training in a range of 'skills', behaviour and knowledge beyond the immediate ones relative to a particular trade: for example, religious doctrine, personal morality, literacy, numeracy and account-keeping, needlework, knitting, sewing, 'housewifery', many household management capabilities and so on, and this scope covers many female as well as male apprentices.'

¹⁰⁷ See: Ariffin, 2017.

¹⁰⁸ It is recorded that sometimes the apprenticeship-style of training in some parts of the world includes free labour (Marchand, 2006).

¹⁰⁹ See: Becker, H. 1972. A school is a lousy place to learn anything in. *American Behavioral Scientist* 16, 85-105.

*“...apprenticeship process
(...) is one where
apprentices copy the work
of masters as a repetitive
but non-articulated and
verbalised knowledge
transmission.”*

It is by demonstrating a perfect and successful act that an apprentice learns and mimics the master's actions. Mimicking the actions of masters results in the continuation of traditional forms and methods that were passed on from past generations, but it also suggests that it is for the formation of discipline in both the mind and body (Marchand, 2012). This exemplifies the character and qualities of a good craftsman such as *tukang*. Dillely (2009) has observed that the apprenticeship process in Senegal¹¹⁰ is one where apprentices copy the work of masters as a repetitive but non-articulated and verbalised knowledge transmission. Marchand (2012) defines this as a process of 'implicit pedagogy'¹¹¹. Subsequently, at a later stage of apprenticeships when the stakes are higher, verbal and explicit instructions and the conscious 'implanting of knowledge' or 'cerebral learning' were transpired (Dillely, 2009, p.57). Contrary to modern learning processes, tasks are learned in reverse to the order of production where practical hands-on experience is prioritised over theory (Lave et. al, 1991).

However, apprentices may reject aspects of 'copying' by imitation if it contradicts their contemporary identity by challenging their status, meaning or image (Rapoport, 1983). A *tukang* or apprentices may reject custom and impersonation in their practice and develop new ways of working that reflect contemporary significance and meaning.¹¹² Similarly, the process of negotiation was inherent to the traditional building process (Bronner, 2006) given that the practice is continuously 'apprehended' and 'comprehended' (Wacquant 2004: 118) through the builder's senses, mimesis improvisations and experimental responses (Hallam and Ingold, 2007). As a result, changes and transformations within traditional practices are expected where for most part, by virtue of individual creativity. This illustrates the parallel similarities between vernacular architecture described by Vellinga (2006) and the

¹¹⁰ The context of Dillely's study is within apprenticeships among weavers in Senegal.

¹¹¹ The apprentice immersion in the 'implicit pedagogy' is to find their own way within the practice (often non-verbal) through initial feedback and engagement with the site, the task itself, relations to other building teams and how he or she reacts to orders or instructions.

¹¹² This could explain the rejection or decline of some the former Malay rituals and other building practices – one notable aspect is the use of new materials. Nonetheless, Rapoport posits that cultural change is eminent in tandem with the meaning it holds for the time being.

apprenticeship-style of transmission embedded within it, that are both dynamic and ever-changing.

In Malay society, the transmission of skills and knowledge were negotiated between the builders and communities themselves, which Marchand describes as 'professional interactions' within a hierarchical context (Marchand, 1999, 2006). The conditions in which this happened points towards the notion of 'decentralised' organisation in the 'community of practices' (Lave et. al, 1991) where the possession of 'mastery' reflects the existence of a community of builders who the masters coordinate.¹¹³

While this may be the case, the structure of the Malay community within the Malay *kampung* or village itself contains certain specialist trades, similar to the Western conception of a guild system, albeit un-institutionalised. The *kampung* turns out to be a place for 'collective teaching' (Downey, 2005; Dyck and Archetti, 2003; Marchand, 1999, 2006; Wacquant, 2004)¹¹⁴ and as a place of building participation and assembly, situated on building sites where practices were performed, taught and learned, for craft to flourish (Marchand, 2006).

Within the *kampung* lies the family unit where secrets and esoteric skills and knowledge are only shared within their own lineage of family, based on heredity relationships or procedures (Dilley, 2009; Marchand, 2006). This is considered the final stage of an apprenticeship style of learning, where as mentioned earlier, the stages of an apprenticeship move from mundane repetitive and imitative tasks to an informed social practice, followed by gaining the hidden or secret knowledge of that particular craft (Dilley, 2009; Fox, 2011). This commonly embraces the incantations, rituals, magic, or 'power-practices' often involving non-human or spiritual agents (ibid, 2009). As the transmission of the building culture was mainly from oral traditions, the intention for the legacy to continue strictly within the family was attainable.

¹¹³ Learning from other labourers and apprentices within the 'community of practice' was mentioned in anthropological works of Dilley (2009) and Marchand (1999).

¹¹⁴ Though a craftsmen situated learning environment is within a building site (Marchand, 1999,2006), other places where the notion of apprentices applies, such as the dance studio (Dyck and Archetti, 2003), African capoeira training sessions (Downey, 2005) and the gymnasium (Wacquant, 2004) is similarly a collective place where learning and teaching took place.

The apprenticeship style of transmission reflects a Malay societal view of industry that is modest, while the colonial capitalist systems never penetrated into the *kampung* (Alatas, 1977). This resonates with the traditional Malay notion of working and living from one day to the next (*kais pagi makan pagi, kais petang makan petang*), as opposed to a system of surplus gains (ie. life savings, funds) (Ibid, 1977), therefore practice is recurring on a daily basis. The *kampung* has retained its traditional and highly integrated social and physical values, despite unabating pressure for development and modernisation.¹¹⁵

The outcome of apprenticeship not only fortifies the perfection in building performance but it moulds into the relationships and personalities of the apprentices. The Malay house-building procedure described as *adab, adat* and *tertib*¹¹⁶ is also a reflection towards the characters that are required of a Malay *tukang* or apprentices. The intended result is for apprentices to acquire and form a specific worldview (Marchand, 1999, 2012, 2006) where the Malay house-building culture is concerning the Malay world view (Abdul Rahman, 1999).

Marchand's (2006, p.53) description of the apprenticeship process summarises the intent and outcomes of this teaching-learning relationship:

'By assisting, observing, mimicking and practising, the trainee acquired basic techniques and understanding. Through listening to negotiations and disputes with clients, suppliers, team members and other masons, he became further immersed in the concerns, worldview and social performances of his mentor. These factors, in combination with the secret knowledge he gained, forged the young man's identity as a member of Djenne's bulding community, and ultimately made possible his appropriation of a publicly recognized social position and fulfillment of related professional responsibilities. It should also be noted that the intense engagement between master and

¹¹⁵ Rapoport (1984) uses the example of Indonesia *kampung* or the Yoruba compound, which the author infers to be of similar values in Malay *kampung* due to the shared characteristics of culture within the Malay archipelago.

¹¹⁶ Refer note 82 on *adab, adat* and *tertib*.

pupil equally educated the mason in becoming a mentor. Mentoring processes coerced a critical reflection upon the mason's own skilled knowledge, and upon the control that he exercised over the reproduction of his trade..'

2.4.4 *Tukang's* Performance

Artefacts such as Malay houses are a 'result of what people actually do' (Arnold, 1971, p. 22) rather than a *tukang's* exhaustive description of what they do (Wood, 2009). As a result, it may seem reasonable to suggest that the outcome of inquiries to understand artefacts – such as the Malay house – should emphasise human cognitive aspects (Arnold, 1971, p. 22). This includes the thoughts, memory, perceptions and experiences resulting from the *tukang's* cognition process, which is both intentional and reflexive (Maggio, 2018) and could potentially render the artefact not just as a useful blueprint but to understand the builder of a house, specifically the original *tukang's* thought process.

Subsequently, for traditional Malay societies, their knowledge about things - such as the Malay house - were not purely based on arguments or reason but creativity, wisdom, intuition and inherited practices of the people (Bronner, 2006; Muhammad, 1980). Thus *tukang's* understanding of Malay craftsmanship manifests according to accepted conventional and mostly cultural norms. Nonetheless, as described earlier by Frayling (2011) on craftsmanship, apart from relying on the *tukang's* intuition (or knowledge), the Malay building culture hinges upon their bodily activity, which counts as their dexterity.

"[Constructivism] view of learning as 'building knowledge structures' through progressive internalization of actions (..) [occurs] in a context where the learner is consciously engaged in constructing a public entity.." - Seymour Papert, 2001¹¹⁷

The process of disassembly and assembly requires a physical and procedural conduct between the artefact and the builders – an act of performance. Malay performance arts (ie. dance, theatre, puppet

¹¹⁷ As quoted in Ackermann, E., 2001. Piaget's constructivism, Papert's constructionism: What's the difference. Future of learning group publication 5, page 4.

theatre), have been described as ‘coloured with influences from religions and cultures which entered the Malay Peninsula from Asia and the Middle East at various times from about the 1st century CE’ (Sarwar and Yousof, 2004, p. 12) (Ghulam-Sarwar, 2004, p.12). Similar to the process of house-building, these arts are established parts of Malay culture largely influenced by the animistic belief systems of Malay-Polynesian people, which have been amalgamated by various influences – internally and externally.

In the ceremonial ritual of obtaining *magic measurement* and assembling the *Tiang Seri* (main pillar) for example, apprentices and other participants, including the owner, will learn, watch and assist the master *tukang* and concurrently take an active role (Ariffin, 2001). The rituals create meaning as they represent a sign-system that alters the cognitive space inscribed in the memory of the performer and the beholder (Kyriakidis, 2007b). This memory alters the perception of apprentices during the building process as they are constantly renegotiated and reacted (Bronner, 2006; Marchand, 2006). Hanan (Hanan, 2017, p. 29) describes a similar occurrence in the building culture of Indonesia:

‘The making of houses conveys the social construction of the community, (...) the builder provides demonstrable building skills while others in the community maintain and change the attainment.’

The interaction between the artefact and among participants could potentially involve perceptual-motor skills that cannot easily be expressed verbally (Wood, 2009), pointing towards a somatic experience or ‘bodily dispositions’ (Bourdieu, 1977). In the learning theory of constructivism, the participants involvement with the physical artefacts is an example of learning by making; as ideas are transformed through different representations or artefacts within a specific context (Ackermann, 2001). Eventually, the Malay house as an artefact could become as an ‘objects-to-think with’ to explore and discover its values (Ibid, 2001, p.4) such as past Malay craftsmanship¹¹⁸.

¹¹⁸ Bourdieu (1900) described the ‘Kabyle house’ as an attempt at explaining the interaction between body (of habitant) and a house or architecture. Likewise, the building process could also capture these qualities of interaction in a similar way but contextually different.

As heritage could be seen as performance, in explaining the cultural heritage of dance, Lacono and Brown (2016, p. 95) regard traditional dancing to be 'embodied in individuals, in connection with the artefacts they produce and use and the environment they interact with.' Dancing is a somatic activity 'expressed through practices, activities and performances' (Ibid, 2016, p. 95) of a particular culture, and this can be said of Malay building culture which in itself represents bodily movements in assembling structures that are procedural and strict. Unlike dancing, the process of building the Malay house reflects the type of interaction with the whole artefact (Malay house) or its disassembled parts based on its procedural actions, hence the type of bodily activities varies according to the phase in construction. The tukang's body serves as the memory where, 'the principles embodied in this way are placed beyond grasp of consciousness, and hence cannot be touched by voluntary, deliberate transformation, [and] cannot even be made explicit'¹¹⁹.

In another essential point, Bourdieu emphasises the concept of somatic involvement by describing that bodies can be 'mnemonic devices', integral to the 'practical taxonomies' and cultural expressions of a *habitus*¹²⁰, which is inculcated more by 'experience' or observation than 'explicit teaching' (Jenkins, 2002, pp. 75-76). Edgeworth (2011, p. 45)¹²¹ describes this as embodied knowledge that involves tacit dimensions which are impossible to be 'taught in a classroom or put into a procedures manual'. In this instance, the learning process is not only realised through the artefact such as the Malay house, but rather between the participants themselves. The process of *Tukang* performing and apprentices or participants acting and observing Malay house-building constructs a two-way collaboration or feedback in the form of 'perception, stimulus, or formation of memories' (West and Bowman, 2010). The involvement results in distinctive implicit learning upon

¹¹⁹ Bourdieu, 1977, p.94.

¹²⁰ As described earlier, *habitus* is a condition where the world's structural constraints form 'permanent dispositions' or 'bodily dispositions' (Bourdieu, 1977)

¹²¹ Edgeworth is explaining the somatic practice of excavating in archaeology, which according to the author has similar context: in both the relation towards the historical artefact and that, which involves trying to understand and solving any problem involved.

different participants within the building process¹²². Nevertheless, it is upon the performance and engagement of apprenticeships in ‘congruent ways’ that renders the learning process to be successful (Lave et. al, 1991:21).

The performance of *tukang* and building participants interacting with building artefacts suggests that all parties (*tukang*, apprentices, artefacts, and tools) as a ‘potential visual model’¹²³, as a means of learning from seeing¹²⁴. The master *tukang* is partly the authority, both *tukang* and artefacts are knowledge resources, while other building participants (including apprentices and village people involved) are partially influencing how practicing and understanding unfold – hence learning from all of the didactic ‘visual models’ involving building process is where the skills and knowledge transmission occurs. Particularly from the rituals conducted and when it is performed repetitively, creates a visual ‘pattern’ or a kind of ‘script’ that guides the performer for the rites to be recurring in the same way (Marcus, 2007).

2.4.5 Reverse-Engineering for discovery

In the contemporary world, the discovery of ideas and knowledge is vast and fast-paced, hence a practical kind of learning and transmission should be examined. This study examines reverse engineering, a process to acquire as much information as possible from an object, artefact (including digital software) through close scrutiny and investigation. The term disassemble is synonymous with reverse engineering,¹²⁵ portraying a similar physical and discovery act of disassembly and assembly procedure in Malay house-building culture. Therefore the concept of

¹²² A similar notion of *habitus* introduced by Michel Foucault (1979) refers to an outside form of structure or influence that could inculcate on the mind and body, ‘forming permanent dispositions’ on them. As the hierarchy of *tukang* and apprentices exists in a linear way, the aspect of individual authority and creativity exists, thus the mnemonic aspect is visible and well-understood.

¹²³ See; Wacquant, 2004, p.113.

¹²⁴ Herzfeld termed this as ‘stealing’ or learning with the eyes. See: Herzfeld, 1995, p.139-140; 2004, p. 107)

¹²⁵ ‘Disassembly’ according to Rekoff (1985) is to isolate elements of the items in order to trace and verify various interconnections and establish correlations between the elements and the world outside. Concerning the Malay house building, the correlations depict both the material as well as immaterial factors that are pertinent.

reverse engineering provides a conceptual understanding of how an artefact such as a Malay house could be understood from its physical form. Reverse engineering uses contemporary technical procedure, hence could provide insights and alternative view of how a traditional artefact could to be treated as an object of inquiry and discovery.

Reverse engineering in the domain of 'discovery' relates to a lawful way of obtaining the 'trade secrets' of a product or artefact (Samuelson and Scotchmer, 2002, p. 9). The process and literature of reverse engineering is not limited to the engineering or computational field but exists in other studies such as archeology¹²⁶, psychology, artificial intelligences, biology and biotechnology. Fundamentally, reverse engineering is a process to examine, identify and understand existing systems (Tilley et al., 1994, p. 3; West, 1993) and to extract 'missing knowledge, ideas and design philosophy' from anything manmade (Eilam, 2011).

Reverse engineering is a reversal from a normal engineering process of 'turning a specification into a product for performing to it' (Musker,

¹²⁶ Within the field of cultural heritage and archaeology, attempts have been made to explore maritime artefacts known to 'embody technological advances', contributing in the development and evolution of boat building (Menna et al., 2012). Laroche et al (2008) had adopted reverse engineering to capture technical characteristics in past industrial artefacts to rediscover the 'enterprise process' and understanding its 'integration in the economic context'. Similarly, da Silva's (2014) thesis attempted to determine the behaviours of past community based on the assessment of archaeological artefacts by implementing the notion of 'perception' in the reverse engineering as part of the main framework. According to Bradley and Currie (Bradley and Currie, 2005, p. 705), computational reverse engineering process was used to document the well-known sculpture of David in Galleria dell'Accademia, Florence, to allow specialists and the public to view David in unintended and otherwise impossible ways such as the intricate details of the 'artist's chisel marks'. In architectural conservation such as at the old fortress in Timiosora, Romania, researchers have adopted reverse engineering to improve efficiency in documenting and understanding difficult and large data collection (Musat and Herban, 2012). Similarly, in the evaluation and monitoring of Nemrut monuments in Turkey, Türer et al (2012), employ the reverse engineering process to investigate and identify different damaged scenarios of the heritage sites. The outcomes of both research projects are relevant in large conservation practices as a holistic approach to address not only the physicality of artefacts in query, but also intangible issues such as social and economic value (Türer et al., 2012). While most of the examples provided embraced the use of digital tools as part of the reverse engineering process, this study only employed the concept, to give a broader view of reverse engineering in relation to the qualities presented in the Malay house-building culture.

1998) into, 'starting with the known product and working backward to divine the process which aided in its development or manufacture'¹²⁷. This is done by 'inferring how a particular mechanism works' (Lee and Johnson-Laird, 2013)¹²⁸ and presents the opportunity to capture various but specific data such as form, texture, size, geometry, weight (Menna et al., 2012; Shpitalni et al., 2015) as well as 'location and structure' (Cheng and Jin, 2006). When used as a 'knowledge-based' approach, reverse engineering could potentially recognise and classify certain 'patterns' of an artefact (Fisher, 2004) by taking it apart, measuring it and subjecting it to physical testing (Samuelson and Scotchmer, 2002, p. 10) while 'figuring out what each piece does' (Eilam,2011)¹²⁹.



Figure 2.27 Reverse Engineering adopts the disassembly process, by taking apart the components of an object in order to understand its mechanics. Source: www.ifixit.com

¹²⁷ Samuel and Scotchmer (2002, p. 4) quoted from the standard legal definition of *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974).

¹²⁸ This process suggests few conditions of reverse engineering: (i) It only works on an existing product; (ii) made and designed by someone else; (iii) to understand its essential quality and (iv) to make sound judgments from it.

¹²⁹ In his introduction in his book, *Reversing: Secrets of Reverse Engineering*, though Eilam writes about reverse engineering based on software engineering, he describes the concept of reverse engineering as a traditional physical procedure upon objects or artefacts.

The implementation of reverse engineering in commercial products is a physical intervention of a 'manmade'¹³⁰ artefact by 'someone other than the original designers' (Rekoff, 1985) that embodies the intent, methodology, knowledge or know-how discovered by others (da Silva, Dias Moitinho de Almeida, 2014, p. 78; Rekoff, 1985, p. 246; Samuelson and Scotchmer, 2002, p. 4). Consequently, an artefact is a product of human culture that expresses the 'fundamental properties characterising'¹³¹ aspects of society. For example, Malay houses characterise past *tukang* as being part of the making process involving technical building knowledge and ritual acts. Perhaps it is similar to the physical evidence left behind in Malay houses, commonly in the form of markings on building components or ritual items: hair, gold coins, coloured rags and others (Al-Ahmadi, 2000; Lim, 1987; Nasir, 1985; Nasir and Wan Teh, 2011) that narrates the types of beliefs, practice and rituals conducted.

Due to the lack of existing blueprints of traditional artefacts such as Malay houses, reverse engineering is relevant (Cheng and Jin, 2006; Chikofsky and Cross, 1990; Musat and Herban, 2012; Samuelson and Scotchmer, 2002; Tilley et al., 1994). Blueprints in Malay building culture are scarce and often non-existent,¹³² owing to Malay *tukang* relying on their inheritance in the form of oral accounts, intuition and bodily experience. Therefore, reverse engineering could 'recapture the top level specification' (Musker, 1998), improving our understanding of the lives and cultural experiences of the people who built these houses. For example, the approach to understand and reconstruct the archeological whalebone housing in Thule, Greenland¹³³ is highlighted by Musat and

¹³⁰ Eilam (2011) though describing the context of his study in software engineering, expresses the term 'manmade' in comparison to a scientific research, which is based solely on 'natural phenomenon'.

¹³¹ Laroche et al (2008, p. 4) quoted the biologist Jacques Monod translated from Monod, J., 1970. *Le Hasard et la necessite'*. Paris: Editions du Seuil.

¹³² Dr. Syed described the distinctive case of Istana Sri Menanti, a traditional multi-storey timber palace in Negeri Sembilan to have submission drawings due to its period during British rule.

¹³³ Researchers attempted to reconstruct the geometry and space of the house using a digital approach in reverse engineering by adopting 3D imaging and laser scanning (Levy and Dawson, 2006). The methods adopted though irrelevant to disassembly and assembly discussed here, present a similar approach to disassembly and assembly: archaeologists considered the assumptions, reasoning, suggestions from other existing artefacts and previous studies as part of the process to acquire the exact form of the house to reconstruct.

Herban (2012, p. 1108): 'to create representations that document the subject and facilitate our understanding of it - what it is, [and] how it works'.

The reverse engineering process requires causal learning and hypothesis testing (Lee and Johnson-Laird, 2013) in several stages, with various approaches as described generally by Musker (1998):

- i. Analysis of an artefact in its physical and non-physical state,
- ii. Producing multiple inception of an artefact's description¹³⁴,
- iii. Reverse Engineer's collective analysis of the artefact to produce a specification, and
- iv. Reproducing a new artefact using the specification extracted, either in theory or practice.

To analyse an artefact, Rekoff (1985, p. 245) recommends identification of the hidden mechanism that defines the 'specifics of [the] original designs' or factors that established those specifications. Secondly, to produce a product description of an artefact, Rekoff (1985, p.244) suggested two different specifications to consider: functional (performance, configuration or 'mechanism-of-operation' in the house-building system) and dimensional specifications (size, length, threads, fits, etc). The third phase is to produce a specification from 'human analysis' and judgments (Musker, 1998) conducted through the process of 'disassembly'¹³⁵ (Rekoff, 1985, p. 251). Extending this strategy towards Malay building culture, the disassembly method is conducted through the structural hierarchy from a macro level (ie. house form), progressing down to the micro level (ie. building components or details such as *tanggam*) 'until further decomposition is not possible' (Rekoff, 1985, p. 245). However, Rekoff (1985) cautions that the process should

¹³⁴ This is mentioned throughout this sub-topic as 'description' or 'product description' to explain the detail account of interpretations and explanations of findings, be it in the form of oral, written or understanding. In customary account of disassembly and assembly conducted by *tukang*, the author hypothesizes the process of reverse engineering as an unconscious state of mind that was never justified formally.

¹³⁵ Rekoff (1985) describes a detail account of reverse engineering in commercial products appropriate in the reproduction of hardware.

be performed in a manner of ‘analysis before disassembly’¹³⁶ to prevent ‘destroying or obscuring valuable information’.

In order to conduct reverse engineering holistically, a diverse range of cognitive processes such as deduction, induction and creativity are required (Eilam, 2011). Deduction and induction clarifies the necessary detail in the intent of the reverse engineer and in the selection of knowledge and skills anticipated from the findings. Meanwhile, creativity resonates with the capability of the reverse engineer to interpret and identify existing patterns from his or her former knowledge and experience (ie. posteriori knowledge), references to other artefacts or previous studies (Levy and Dawson, 2006), prior designs and technology (Rekoff, 1985, p. 246), material or technical limitations as well as the idea of immaterial in the social context (Laroche et al., 2008). These elements are necessary to ‘reconstruct’ and ‘re-establish’ the understanding of the original artefact; be it in the physical form or the theory surrounding it.¹³⁷ It can also help scrutinise the artefact beyond its geometric character, turning it into a ‘dynamic process’¹³⁸ that is not finite nor has a predetermined element (Laroche et al., 2008, p. 4). When relating to building culture, the process of disassembly and assembly is an active process, where each building component is treated as a unique living object.¹³⁹

The outcome of reverse engineering is commonly a duplicate or a surrogate of an existing artefact. The former is the process of creating a cloned version, while the latter produces an artefact that overcomes

¹³⁶ Reckoff (1985) suggested identifying the “system engineering” of each element ie. ‘Functions’, ‘interrelationships between them’, ‘basic mechanism’, ‘role in each operating scenario’, ‘critical parameters’, performance etc.

¹³⁷ In addition, as suggested by Dr Fawaz, a Malay house should not be viewed as an individual object, rather in relationship towards the Malay culture, other Malay arts and crafts and more importantly the characteristics and aspirations of Malay people.

¹³⁸ Laroche cited Jeantet’s 1998 paper entitled “Les objets intermédiaires dans la conception. Elements pour une sociologie des processus de conception” (in French) on intermediate object theory that describe object as part of a dynamic process where it can be ‘a raw material; a manufacturer; an intermediate component or a final component.’

¹³⁹ Both the house and building components as suggested in this study provides ‘meaning’ and hidden knowledge. The outcome of this requires contemporary *tukang* to piece together the uncovering of past knowledge and skills of previous *tukang* who made them. Past elements could also be interpreted as the embodied *semangat* or the *Guru Asal*.

existing defects and improves its capability¹⁴⁰ (Rekoff, 1985). Nevertheless, there are challenges in reverse engineering; human limitations and imperfections in prior knowledge, 'discovery' and analysis involving human thoughts¹⁴¹ (Jahnke and Walenstein, 2000, p. 22; Musker, 1998). As a result, reverse engineering may 'contain errors (incorrect beliefs), inconsistencies, unconnected ideas, and vague, unverbalisable concepts' often in conflict with the 'assumptions, conventions and beliefs' of the one conducting the process (Jahnke and Walenstein, 2000, p. 23). Consequently, even in the reverse engineering of software, the process of understanding is heavily dependent on the conductors' own cognitive ability (Tilley et al., 1994) as 'knowledge is not arbitrary, because the objects that humans construct are not arbitrary' (Fisher, 2004). It is therefore inevitable that actions in human cognitive analysis from reverse engineering lead to 'imperfect knowledge' or 'imperfect procedures', resulting in distinct interpretations and perceptions among the conductors.

If defining the Malay house as an artefact that could potentially be a valuable source of knowledge for a *tukang*, (and eventually a basis for developing skill-sets) then the study posits that the Malay house is considered as a 'conceptual object that has meaning to humans' ("Guidelines For The Preservation Of Digital Heritage," 2003) which can potentially be reverse engineered. The term disassemble is already synonymous with reverse engineering and the building process of Malay houses, hence the concept of reverse engineering applied to the Malay house could potentially promote the discovery of information relating to its physical and embodied properties. The emphasis should be on understanding the non-physical: the immaterial qualities or poetic aspects of Malay building culture. This is made possible as Malay houses are artefacts rich in both tangible and intangible elements and are already destined to be manipulated and reconfigured.

¹⁴⁰ This is analogous to the 'trial and error' of past practices of building Malay houses in the development of techniques and form, through the process of disassembly and assembly.

¹⁴¹ Jahnke and Walenstein (2000) described reverse engineering based on human involvement such as in 'reasoning, conceptualizing, and problem solving' within the context of software engineering. In their paper, cognitive human actions are sometimes deemed flawed and therefore require an alternative view to support this combination of technology and psychology aspects.

2.5 Preservation of Heritage

The Burra Charter (1999, p.2)¹⁴² and Historic England 2015¹⁴³ defines conservation as a process that looks at a place to retain and reinforce its cultural and historic significances. The latter further adds to the sustainable approach to accommodate changes for people to continue to enjoy and use heritage as necessary. On the other hand, UNESCO's¹⁴⁴ definition of intangible cultural heritage is more appropriate to this study describing, 'the practices, representations, expressions, knowledge and skills – including the instruments, objects, artefacts and cultural spaces associated with them – that communities, groups and individuals recognise as part of their cultural heritage' (Safeguarding of the Intangible Cultural Heritage 2003)¹⁴⁵. This represents a shift from western or museological heritage to, 'expand the definition of folklore into a more inclusive one that would consider not only objects but also the knowledge, values, and social relationships within a community that enable the production of traditional culture' (Bortolotto, 2007, p. 26).

Contemporary theories of heritage are often people and process-oriented rather than artefact or object-centred (or place-specific), reflecting the Faro Convention¹⁴⁶ more than UNESCO. The Faro view of

¹⁴² Article 2 in the Burra Charter (1999) adds to seek the provision of 'security, its maintenance and its future' as part of the conservation activity.

¹⁴³ Historic England is a public body that champions and looks after historic environment. The body produces professional advice notes on conservation. See more: England, H., 2015. Making Changes to Heritage Assets | Historic England [WWW Document]. URL <https://historicengland.org.uk/images-books/publications/making-changes-heritage-assets-advice-note-2/> (accessed 4.4.17).

¹⁴⁴ The United Nations Educational, Scientific and Cultural Organization.

¹⁴⁵ For the complete English text of the Convention, see UNESCO. 2003. International Convention for the Safeguarding of the Intangible Cultural Heritage (Paris, October 17, 2003) <http://unesdoc.unesco.org/images/0013/001325/132540e.pdf> (retrieved March 20, 2015)

¹⁴⁶ The Faro Convention was adopted by the Committee of Ministers of the Council of Europe on the 13th of October 2005. It emphasises the significant aspects of heritage relating to human rights and democracy by promoting a wider understanding of heritage that belongs to a specific community or society. The convention places priority over the uses, meanings and values of cultural heritage attached to people rather than the objects (artefacts) and places. Each of the member states within Europe is provided the autonomy to decide the most feasible means to 'implement the Convention according to its legal or institutional frameworks, practices and specific experience'. For further reading

heritage is concerned with how people interpret and interact with the 'constantly evolving values, beliefs, knowledge and traditions' of heritage which emphasise the importance of people's rights to participate and given the responsibility in making of local identities (Council of Europe, 2005). It is about democratising the process of using, utilising and exploiting¹⁴⁷ cultural heritage (and objects) for broader social benefits (González-Ruibal, 2013). Historically the protection of heritage, either in jurisdictions or definitions, has been dominated by experts, however, the 'balance of power' has changed decisively (Fojut, 2009). Experts as 'guides' and 'educators' are now seen to serve the interests of the public or non-experts (Ibid, 2009, p. 16), democratising heritage expertise (Holtorf 2007, 2012b).

"...heritage meanings and values are not only attached to artefacts, buildings or sites, neither are they frozen in time. They are the results of repeated and ongoing interactions in the lived world of people such as tukang."

Entrusting cultural heritage to the hands of the people is reasonable as they construct heritage socially in the context of their own lives and imaginations, interacting meaningfully with their past, shaping visions of their own future (Thomas, 2004; Lowenthal 2005). This fundamental understanding emphasises that heritage meanings and values are not only attached to artefacts, buildings or sites, neither are they frozen in time. They are the results of repeated and ongoing interactions in the lived world of people such as *tukang* (Byrne, 2008).

Subsequently, the issue of conserving or preserving cultural heritage in Southeast Asia requires a step back to examine who owns the heritage, who manages it, who defines it, and for whom it is preserved. While the traditional Malay house is preordained for the Malay people, the aspect of 'who' within the study of Malay house-building culture should also be given emphasis, in describing the signifiante of *tukang*, apprentices and other building participants. This is particularly challenging due to the everchanging nature of Malaysian demographics and the extinction of traditional builders, the building culture and the traditional house itself.

refer: Convention on the Value of Cultural Heritage for Society (Faro Convention, 2005) [WWW Document], 2018 . Culture and Cultural Heritage. URL <https://www.coe.int/en/web/culture-and-heritage/faro-convention> (accessed 6.13.18).

¹⁴⁷ González-Ruibal (2013) argues that 'heritage' should be used in an active sense to exploit the cultural heritage and its artefacts or objects in a diverse ways: 'by understanding, explaining, celebrating, changing and modifying, even destroying and replacing, and of course sharing and using.' He further defines heritage as objects, as actions and resources that gives heritage a broader social value and relevance to the people.

Current Asian heritage management, in contrast to its 'tangible' counterpart, was conducted to ensure the continuity of paradigms such as social cultural values and spiritual inclinations, which is what outlived mostly until today (Chapagain, 2013, p. 9-10). Perhaps this is due to Asian people and potentially their culture as being 'dynamic' (Asquith and Vellinga, 2006; Vellinga, 2006; Welty, 1966, p. 1). Metaphorically it could be seen as a 'living' thing rather than 'static' (Chapagain, 2013). However, this could also complicate the definition of heritage, particularly from UNESCO, that defined tangible and intangible or material and immaterial¹⁴⁸ aspects as isolated components rather than a composition of elements.

The tangible aspect of the Malay house is its physicality while the intangible relates to people, activities, culture and nature. It is also possible to relate the aspect of people's physicality or bodily relation similar to tangible¹⁴⁹. However, the definition of tangible and intangible mostly point to a divide rather than positing these as equal parts (Chapagain, 2013; Silva, 2010; Smith and Akagawa, 2008). Nevertheless, the idea of tangible and intangible in the Malay house building culture is non-exhaustive. By definition it recognises ways the Malay people are involved while instinctively interpreting in the process of heritage that embraces the Malay house-building as an evolving and constantly modified culture (Chapagain, 2013, p.3).

Equally important, the Asian heritage – such as in relation to the Malay house – is fundamentally based on 'philosophies and religious systems',¹⁵⁰ which seek cultural rather than physical patrimonies. In the same way, the Malay oral tradition dominates in the transmission of stories and knowledge related to heritage of past Malay building culture. Thus the Malay *tukang* may rely on their own interpretations, present

¹⁴⁸ Explanation on a wider definition to tangible and intangible is discussed in section 2.1.3 Poetics of Malay vernacular architecture.

¹⁴⁹ Lacono and Brown (2016) interpret the body in the dancing cultural heritage as tangible models where heritage is embodied in the physical form of the dancer or dance participants. This could be similarly linked within the process of disassembly and assembly of Malay houses where *tukang* and apprentices' somatic experiences are contributions of heritage.

¹⁵⁰ Howe and Logan (2002, p. 248) posit that Asian heritage managements prioritise conserving intangible and religious sites than urban built environment. Possibly an answer to why Malay houses are currently 'extinct'.

surroundings as well as on imaginative stories told, or reveries passed down from one generation to the next. Kostos (1985, p. 5) described these speculative expressions with regards to architectural heritage as just beneficial; 'for architectural reality has more to it than stick and stone, and the history of architecture more dimensions than just categorical'. Likewise, in order to understand this Malay architectural heritage, one must provide a 'fair interpretation of the literary and archeological evidence - and a credible form architecturally,'¹⁵¹ which implies both tangible as well as the intangible.

2.5.1 Intangible and Tangible Dichotomies

Reflecting on the UNESCO definition of cultural heritage, the traditional Malay house could be labelled as a tangible cultural heritage or cultural artefact that provides an important resource in reference to the culture and society that produces them. Meanwhile the practices and building process could be described as intangible. As there is, 'no traditional culture without living participants in a tradition' (McCann et al., 2001, p. 58), consequently, the study emphasised that the builder of the traditional Malay house – the Malay Master *tukang* - is the bearer of intangible heritage and the skills, knowledge and ritual practices associated with it.

In its entirety, it is argued that the division of tangible and intangible heritage is problematic due to its intertwined nature (Lacono and Brown, 2016, p.95). The division of tangible and intangible is seen as a hindrance to progress and contradictory to the Asian heritage culture discussed earlier. Subsequently, UNESCO only acts as an 'active agent of contemporary globalization of heritage'¹⁵² while the countries (member states) would act upon it themselves on site. Hence it is often found that the global and indigenous philosophies of heritage may differ, resulting in some countries abandoning their own indigenous practices to a more homeogenous implementation (Chapagain, 2016).

¹⁵¹ Kostos (1985) described the attempt to reconstruct the Mausoleum of Halikarnassos from literary evidence, remaining artefacts and current knowledge in the development of Greek architecture.

¹⁵² This term was used by Chapagain (2006, p. 10) to describe UNESCO's position.

An important notion within UNESCO's 2003 definition of intangible cultural heritage lies in two fundamentals: 'Collective memory' and 'Authenticity' (Bortolotto, 2007, pp. 26-28). In this regard, collective memories of communities are acknowledged as part of the approach to frame cultural heritage rather than relying on scientific analysis, which is regarded as 'fixed' and 'static'. As a result of these collective memories, it could determine the authenticity of heritage defined. In contrast, heritage is now dynamic, which 'stresses the importance of reproduction and transmission of practices for elaboration and adaptation by future generations' (Bortolotto, 2007, p. 27). While maintaining the notion of heritage restoration and recovery, cultural heritage could be regarded as a living and creative process (Ibid, 2007; Chapagain, 2013), while the practices associated with it are important for 'the management of change' (Fairclough, 2009).

In correlation, Lacono and Brown (2016, p. 8) argue that the use of a 'post-dualist idea of duality (a unity of two divergent aspects of the same reality)' as an alternative model to the argument of tangible versus intangible within a cultural denomination. Lacono and Brown (2016) suggested the term 'living cultural heritage' to replace the intangible cultural heritage¹⁵³ with an attempt to re-frame the heritage where 'material and immaterial identities interact' (Ibid, 2016, pp. 86). The model is grounded on the premise that certain types of heritage such as dance are embodied in individuals (thus consisting of both tangible and intangible¹⁵⁴) and that heritage is constantly changing in response to the creativity of the participants.

To draw a parallel, the alternative 'living cultural heritage' could demonstrate that a Malay house, although an artefact, should be scrutinized comparably with the building process within the Malay building culture. Both the building as an artefact and house-building practices, are simultaneously tangible and intangible in order to offer an

¹⁵³ Lacono and Brown (2016, p. 92) are concerned in ways intangible is portrayed in a dance heritage where it 'creates a dichotomy between tangible and intangible domains, which is analogous to the mind-body Cartesian dichotomy for the way in which it separates the immaterial and material'.

¹⁵⁴ It was speculated that human heritage represents tangible as a 'physical embodiment of culture and heritage', while intangible as 'human consciousness', 'soul', 'spirit' and 'psychological engagement with human beings' thus 'human heritage is always and at once tangible and intangible' (Kearney, 2008, p. 211).

'alternative stance on human mind-body-society-environment-artefact relationships' (Lacono and Brown, 2016, p. 94). As a result, the somatic performance in the practices of *tukang*, particularly in the 'intangible' disassembly and assembly process, are now 'tangible' where these actions personify the physical embodiment of culture and the spiritual consciousness it transpires. The relevance of this argument lies in the embedded characteristics of Malay house-building and the current challenges faced in the conservation and preservation of Malaysian architectural heritage.

2.5.2 Malaysian architectural heritage

"The ephemeral condition of Malay house structures that are made of timber adds to the drastic decline in the Malay architectural heritage."

The ephemeral condition of Malay house structures that are made of timber adds to the drastic decline in the Malay architectural heritage. Although Malaysia timbers are normally hardwood, eventually they will decay due to the harsh tropical weather and the lack of maintenance (Harun, 2011). On the other hand, the cultural beliefs of traditional Malays are a hindrance to the preservation. Past Malays considered it unlucky to restore houses that were in a state of disrepair or to demolish the whole house completely; as a result, houses are simply abandoned and left to fall down naturally (Gullick, 1987, p. 183). This was also reflected into their living where the sense of impermanence was a convention (Ibid., 1987, p. 183).

Recently, increasing attention has been afforded to heritage with many realising the importance of the preservation of Malay houses that are still standing. Malay heritage structures in a state of 'ruin' are being restored, however the process 'can only be a consolidation and preservation of the status quo'¹⁵⁵. To some extent the status quo can be restored and preservation guaranteed in the 'maintenance' process conducted. However, it seems that there is a 'trend' in adopting Malay heritage structures as part of a cultural experience motivated by commercialisation and profit¹⁵⁶. Furthermore, only a handful of projects

¹⁵⁵ See; Brandi, 1963 as quoted in Price, N. S. et. al., 1996. *Historical and Philosophical Issues in the Conservation of Cultural Heritage. Los Angeles : The Getty Conservation Institute.*

¹⁵⁶ There are numerous developments adopting Malay heritage buildings as part of the tourism industry. Among them is the Terrapuri heritage project located in Terengganu, which had reconstructed multiple Terengganu traditional Malay houses into guest-houses for tourists.

have attempted to reinvent the *tanggam* or disassembly and assembly system within post-‘traditional environments’ (See; AISayyed, 2004; AISayyed and Tomlinson, 2011)¹⁵⁷. However, the intention is rarely the preservation of an authentic building culture and the traditional know-how accompanying it.

Malaysia has been a member of UNESCO’s Convention Concerning the Protection of the World Cultural and Natural Heritage since 1988. Besides UNESCO or ICOMOS, Malaysian heritage buildings fall under the laws and regulation of Johor Enactment 1988, Malacca Enactment 1988 and National Heritage Act 2005¹⁵⁸. The Antiquities Act 1976 (Act 168) was used prior to the introduction of the National Heritage Act 2005 on 31st of December 2005 in regards to conservation and preservation of national heritage. These include buildings, monuments, treasure trove and cultural heritage in Malaysia. In addition it is also governed by the local Town And Country Planning Act 1976 (Act 172), Local Government Act 1976 (Act 171), National Land Code 1965 and Land Acquisition Act 1960 which mostly relates to issues within the local municipality and land matters, thus requiring other acts for implementation (Hussein, 2014). Others such as the Treasure Trove Act 1957 relate to the discovery of treasures, however it is now obsolete.

Conservation had started during British colonisation through excavation and archaeology activities, but building conservations started circa 1980s (Ahmad, 1997) after the booming construction industry in the 1970s that destroyed most of the historical buildings and sites. It was not until the 2000s the profession of a Building Conservator or Architect Conservator was introduced in conservation projects pertinent to the reconstruction of heritage buildings (Harun, 2011, p. 42). Unfortunately, although at least 173 cultural heritages have been listed under the National Heritage Act, the heritage buildings in Malaysia are declining

¹⁵⁷ Traditional environments, whether located in urban or rural context, are the established by members of traditional societies, including ‘spatial statements of a heritage that is handed down from one generation to another’ (AISayyed and Tomlinson, 2011). ‘Whether located in urban contexts or in rural areas, traditional environments are typically created by common people without the help of a professional’ (Ibid, 2011). See Also: Oliver, 1989.

¹⁵⁸ In Malay it reads as: Akta Warisan Kebangsaan 2005. See: Kerajaan Malaysia, (2008), Akta Warisan Kebangsaan 2005 (Akta 645).

and limited¹⁵⁹. This is a result of negligence and deteriorating of heritage buildings due to age and poor maintenance (Harun, 2011).

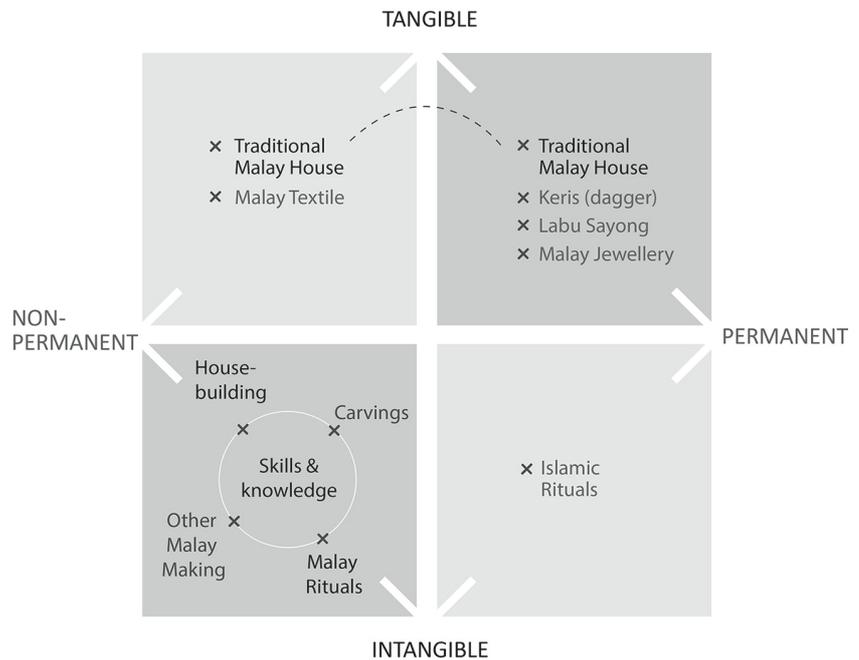


Figure 2.28 Tangibility, intangibility and permanency of traditional Malay houses compared with other examples of cultural heritage in Malaysia.
Source: Author, 2013

The emphasis on disassembly and assembly and with regards to Asian heritage management of Malaysian buildings is much related to the fundamental principles proposed by Keromo¹⁶⁰. Originality in architecture, building materials, building culture and its builders, as well the authenticity in techniques and making process are the main points proposed. This resonates with the aspiration of the Malay *tukang* in continuing the building culture, which at times may have been contradictory with UNESCO and ICOMOS heritage values (Silva and

¹⁵⁹ A study was conducted by the Heritage Trust of Malaysia, stating that there are at least 39,000 historical buildings throughout Malaysia, built between 1800 to 1948. These building were said to be worthy of preservation and conservation, however, it is unknown whether some of these buildings were Malay houses. See: Kamal, K.S., Ab Wahab, L., Ahmad, A.G., 2008. Pilot survey on the conservation of historical buildings in Malaysia.

¹⁶⁰ Keromo, P. (2006). *Konservasi Secara Umum: Garis Panduan Konservasi Monumen dan Tapak Bersejarah di Malaysia* [Translated: General Conservation: Guidelines in the Conservation of Monument and Historical Sites in Malaysia]. Bengkel Konservasi Monumen dan Tapak Tanah Bersejarah, 27-29hb November 2006. Melaka: Kerajaan Negeri Melaka dengan kerjasama Perbadanan Muzium Melaka (PERZIM).

Chapagain, 2013) as everything within the Asian heritage management, particularly concerning the Malay house building where the culture needs to be understood as a sustained process and in its totality. This leads to a contrasting approach towards a particular objective style, representative time period, physical authenticity and values (Amita Sinha, 2013; Taylor, 2013). Even after the succeeding Malay culture had embraced Islam, the aspect of preservation is consistent with retaining the intangible values rather than the physical fabric or form (Ariffin, 2013). As a result, the conservation attitude of past Malay building culture is inclined towards a collective memory and symbolic meaning.

2.5.3 Reconstruction of traditional Malay houses

Conservation of historical and vernacular buildings in Malaysia such as the traditional Malay house has been intensified with the introduction of new acts and government establishments (Johar et al., 2010). Restoring the Malay houses that are still standing aims to prevent the extinction of local architectural heritage, but more importantly is also an opportunity to learn about past Malay house craftsmanship. Therefore, considering the classifications of conservation activities such as preservation, restoration, reconstruction, rehabilitation and adaptation, the conservation concept of Malay houses could be said to associate with the disassembly and assembly practices.¹⁶¹

The traditional disassembly and assembly practices accommodate the conservation activity described above such as in 'preservation'¹⁶² as a Malay house had to be reinforced and tightened using *baji* (timber wedges)¹⁶³ from time to time in order to strengthen the integrity of the structures. Hence, the Malay house endures daily human interaction and intervention, an animate quality or 'living' associated with houses of Southeast Asia that includes the house being endowed with *semangat* and house form reflected from the human 'figure' (Carsten and Hugh-Jones, 1995, p. 37).

¹⁶¹ Preservation is defined as to keep 'everything intact with less intervention' (Chapagain, 2016, p.26)

¹⁶² These definitions are defined in the National Heritage Act (2005, p.14-15), however, there are no specific definitions in the aspect of adaptation - only to acknowledge this as part of the conservation process.

¹⁶³ Refer section 2.2.2 and 4.6.2.

As in restoration, decaying timber components from a Malay house could be replaced individually while the overall structure could still maintain its original form. Reconstruction lies at the heart of the disassembly and assembly process of Malay houses as it is meant for a partial or 'complete overhaul of the structure' (Chapagain, 2016), sometimes seeking to recreate the missing pieces within the artefact. Reconstruction as in 'rebuilding' (or renewal) of Malay houses is a manner of synchronizing both the historical and heritage clock, where 'history stands still [while] heritage continues to age' (Kirshenblatt-Gimblett, 1998, p. 198). The term 'anastylosis'¹⁶⁴ is mentioned (Ibid, 2016) where in a building conservation, all parts are 'dismantled and reconstructed, using the same parts in the same original/extant fashion'. 'Anastylosis' is defined within the reconstruction process with the aim to accurately put together an artefact such as the Malay house in its authentic form.

Meanwhile, in rehabilitation and adaptation, the former is defined as returning the artefact towards its full potential and efficiency in usage.⁷¹ Similarly, the latter, although it has similar meaning to the former, is much focused on modifications in order to accommodate contemporary use and demands (The Burra Charter, 1999, p.2). Both aspects of conservation within Malay timber structures are justified in the process of disassembly and assembly as it caters for the expansions and reduction of structures as well as spaces, which is why the study seeks to see its potential not just in conservation practices but also in ways that house-building culture could benefit. Supporting builders such as *tukang* to rebuild Malay vernacular structures is to learn and benefit from their 'unmeasureable' experiences, knowledge and skills (Oliver, 2003).

2.5.4 Preserving Malay Building Culture

It is generally known that heritage buildings are artefacts for preserving history, as they contain explicit and implicit historical values (Powell et al., 1994). Explicit could describe the physical aspect while the implicit, of cultural connotations. Heritage buildings such as Malay houses provide us with a sense of wonder and curiosity in learning about people

¹⁶⁴ 'Anastylosis' is an archaeological term derived from the Ancient Greek to convey the meaning of 'again' and 'to erect (a stela or building)'. It is used to describe a reconstruction technique of a ruined monument or building, restored to a greatest degree using original architectural elements.

and other cultures (Feilden, 2007, p. 1). Exploring these heritage buildings could potentially reveal associated historical and cultural evidence (Orbasli, 2008), with vernacular architecture acting as a source of building knowledge for the present and the future (Vellinga, 2017). More importantly, heritage buildings contribute in protecting the values of a place and culture, eventually creating a sense of identity as well as continuity in the present (Feilden, 2007, p. 1; Kamal et al., 2008)¹⁶⁵.

The emphasis on the disassembly and assembly process with regard to Asian heritage management is related to the fundamental principles proposed by Keromo:¹⁶⁶ originality in architecture, building materials, building culture and its builders, as well the authenticity in techniques and making process are the main points proposed. Nonetheless, Vellinga (2017) suggests an action-oriented approach for the development of progressive vernacular studies, reviving the dynamism of historic cultural practices such as Malay house-building. It resonates with the aspiration of the Malay *tukang* in preserving the building culture, however may have been contradictory to UNESCO's and ICOMOS's heritage values (Silva and Chapagain, 2013). In particular, the authenticity in the preservation of heritage Malay houses is less significant compared to the outcomes of emotions, memory and spiritual senses (Ariffin, 2013; Harun, 2011) (Harun, 2001).

Under section 67 of the National Heritage Act 2005, there are at least 9 criteria for potential heritage buildings. Among others that are significant to the study is the 'potential to educate, illustrate or provide further scientific investigation in relation to Malaysian cultural heritage'⁸⁵. In relevance to the Malay building culture, this is to preserve the physical building, acting as a source of knowledge and reference, while the actions and rituals conducted by the building participant is meant to retrieve them. Jennings (1982) describes the noetic dimensions

¹⁶⁵ This is argued to be among the aspiration of the study. Refer section 1.4.

¹⁶⁶ Keromo, P. (2006). *Konservasi Secara Umum: Garis Panduan Konservasi Monumen dan Tapak Bersejarah di Malaysia* [Translated: General Conservation: Guidelines in the Conservation of Monument and Historical Sites in Malaysia]. Bengkel Konservasi Monumen dan Tapak Tanah Bersejarah, 27-29th November 2006. Melaka: Kerajaan Negeri Melaka dengan kerjasama Perbadanan Muzium Melaka (PERZIM).

of rituals or actions¹⁶⁷ pertinent to the discovery of knowledge from Malay houses. She defines the 'rituals' as a way of gaining knowledge, to transmit the knowledge gained and eventually an attempt to display the actions conducted in order for the ritual participant and the observer to understand them critically (Jennings, 1982, p. 118).

An alternative outlook into traditional architecture has been attempted by looking at the mechanics of the architecture itself instead of its physical appearance, focusing on the systemisation of the building and the justification of it (Ibid, 2001). As a result, the revival of tradition can be achieved from a technical standpoint in contrast to inauthentic copies of traditional forms often legitimised as part of 'national identity'.

That being said, in order to discover the hidden knowledge from Malay houses is to explore these artefacts through the disassembly and assembly building process as part of the preservation undertaking within the Malay building culture. Disassembly and assembly process is a physical procedure consisting of actions as well as the rituals conducted where a *tukang* interacts with Malay houses, in a form of a building procedure. Hence, by adopting the 'framework' of her interpretation on the noetic functions of rituals (or actions) (Jennings, 1982), the preservation of Malay building culture is dependent upon both the 'artefact' and the human values.

"...in order to discover the hidden knowledge from Malay houses is to explore these artefacts through the disassembly and assembly..."

Human values are pertinent to the actions or performative process of construction, which in the Malay context is largely influenced by beliefs and culture. The building process of Malay houses emphasises the important of building skills rather than artefacts, and reveals the actions and knowledge selected for transmission (Tuan, 1989). Rapoport (1989, p.82) asks 'what is repeated, through what mechanisms it is repeated, and what, if anything, makes it meaningful'? The answers to these questions may signify the *genius loci* of Malay building culture. As the *tukang* are the subject of this research, the emphasis is to acknowledge and advocate the expert status of them. The Malay house-building tradition revolves around the knowledge and systems they have inherited (or sometimes innovate), and the building culture is

¹⁶⁷ Though rituals are normally associated with 'performance' pertaining to religious beliefs, here ritual is generalised to include all actions of *tukang* in his undertaking of disassembly and assembly building process.

appreciated 'as a set of meaning-making practices' more than the appraisal of Malay physical patrimonies (Marchand, 2006).

In short, rather than a distinct approach in the conservation and preservation of tangible and intangible or the demarcation of a Malay house with a *tukang*, the disassembly and assembly process is potentially a means for the safeguarding and continuation of the Malay building culture, in a form of transmission of skills and knowledge which is a mimic and facilitates the process of apprenticeships. Disassembly and assembly is re-emphasised as a traditional but new methods in finding the forms of meaning, social expressions, conduct and distinctive ways of preserving a culture.

2.6 Conclusion

The vernacular Malay house is distinctive in form than other South East Asia houses due to its small roof typology. It is constructed of timber framed post and beam structure, utilising the *tanggap* joint techniques where the number of columns (six, nine, twelve-column structures) and height of the floors distinguished its characteristic and use among similar Malay house type. The house is considered short-lived as in the use of timber as the main material – structurally, and thus render it as temporary.

The poetics of the Malay house lies in the anthropomorphism – characterised in form and function, symbolic meaning and the elements within it, such as the house *semangat*. It is considered a reflection of the Malay's own image, associating with their moral characters, emotion and imagination, thus demonstrating that a Malay house as an artefact depicts both the tangible and intangible, *technics* and *poetics* (Hawkes, 2007) or the *measurable* and the *unmeasurable*. Having said that, the aspect of poetics in the Malay house is dependent upon the actions or ritual experiences acted upon it as a symbolic relationship between human and object, or *tukang* with the house that could neither be quantified. Moreover, the Malay house is a building craft, 'handmade' by a *tukang* in a process of mutual assistance or *gotong-royong* with other people within the *kampung*.

The main attributes of *tukang* or craftsman as a person who is responsible in building the Malay house is described. As a *tukang*, he is

adept in the construction techniques, a carver who adds intricate carvings for visual aesthetics, ketua adat or imam who leads the prayers and a pawang, who dictates the rites and rituals of people and the building culture, where these attributes distinguished a 'master' among the tukang. While this is the case, the craftsmanship of tukang as a 'builder' lies in his building skills or his mastery in making (Marchand,2012) as well as in the knowledge, that is often dictated by his spiritual and cultural beliefs.

Apprenticeships in past Malay building culture was based on hereditary and similar to the Western hierarchy between a master and the apprentices, however, rather informally. The kampung serves as a setting for the the apprenticeships system based on the Malay value of work and labour that contradicts the view of a capitalist mindset. Hence the Malay apprenticeships flourished based on an accepted agreement within a social responsibility bounded by cultural beliefs that eventually produces honest but flawless works.

The work of *tukang* based on Bourdieu's definition of practice, is based on Malay cultural principles and the other emphasis on the *tukang* himself, in his actions, belief and interactions with people and his subjects: the Malay house. The cognitive and bodily disposition of a *tukang*, imposed upon the Malay structures becomes the basis of this study. The Malay house manifests the continuation of Malay mastery that was passed down from one generation to the other, an embodiment in the concept of Guru Asal. Hence the process of disassembly and assembly within the Malay building culture is a manifesto of the movement, somatic actions and interaction of tukang with his practice and craftsmanship described above.

The disassembly and assembly process consists of actions as well as the rituals conducted by a *tukang* in a procedural manner. This building technique is used during new house-building process and for the intervention of existing structures meant for relocation, renovation and preservation. The Malay house nonetheless consists of embodied explicit and implicit historical values and as an artefact it is potent in preserving historical and cultural evidences associated with it. Therefore, the act of disassembly and assembly in the learning concept of 'constructinism' is an example of actions that in itself is a learning process. The term 'learning by making' fits this description as the ideas

or inspirations are transmitted from one medium to the other – as per Ackermann's (2001) definition of such artefacts as the 'objects-to –think-with'.

Subsequently, the ritual of disassembly and assembly if defined as a way of gaining knowledge (Jennings, 1982), could potentially provide the means for the safeguarding of tangible and intangible heritage of traditional Malay houses. This is imperative to the preservation and conservation measures within the Malaysian heritage management that is often neglected and lacking. Adding to the challenges and contradictions of UNESCO's general definition and approach of heritage described earlier, the Malay building culture should seek an alternative in the management and formula in the continuation of its practice and tradition.

The following Chapter Three introduces the methodology to obtain empirical data from the observations and interviews methods adopted. A general overview of the subjects involved, in particular the *tukang*, were presented to explain the rationale in the selection of subjects towards the contribution of the study. Chapter Three provides the understanding of how data are captured, analysed and later organised and transcribed in order to investigate contemporary practice of the traditional Malay house-building.

Chapter Three.

Examining the Malay Building Culture.

3.0 Introduction

The existing literature on Malay houses described in the previous chapter emphasises on a few main themes within the Malay house-building process such as the *tukang* (craftsmen) and apprentices, crafts and craftsmanship, skills and knowledge discovery or production, and apprenticeship-style of learning and heritage perservations. A qualitative research approach is used in this study as the main method of inquiry, adopting ethnographic and empirical methodologies. This includes conducting fieldwork and interviews with participants in order to gather qualitative information that is often hermeneutically defined, in order to understand the situation in totality. The study seeks to explore the Malay building process, requiring interaction with existing Malay *tukang* or apprentices. An important aspect of the inquiry is to explain the meaningful appreciation of *tukang* and their practice, outlining the process of knowledge and skills in a building heritage that is often taken for granted.

The following sections describe the framework of the research in order to explain the essential theme of the study: Malay craftsmanship in Malay house-building and how it is accepted and/or translated in contemporary practice. In addition the framework describes the study methods, including the gathering of information that is sometimes interpreted and rationalised based on the opinions of individuals, which is nonetheless essential to the thesis. Individual experiences as well as the meaning of the context are considered. This is established in the literature of heritage characteristics within South East Asia that focuses on people rather than tangible artefacts (Ariffin, 2013, 2001; Silva and Chapagain, 2013). Pursuing a similar methodology to Grounded Theory¹⁶⁸, the study dwells upon a territory less examined and comprehended.

¹⁶⁸ A methodology embracing data analysis (in its initial conception) to construct theory; the opposite of a positivist approach in social science research.

Furthermore, the study explains the thoughts and process of the methodology prior to the fieldwork, in an attempt to describe the research approaches that require flexibility. This anticipates the uncertainty of the findings and outcome due to the nature of the neglected condition of Malay house-building culture, which is often conducted in isolation. An important specific aspect of the fieldwork is to capture the essence of Malay craftsmanship, skills and knowledge in practice by conducting interviews and observations on-site with practicing local Malay *tukang*. Further sections will discuss the selection of these *tukang*, while introducing other individuals - researchers, academicians and others - subject of the study who are advocating for Malay house building culture directly or indirectly until the present. While the fieldworks are conducted in Malaysia and in the local Malay language, the study explains the approaches employed in transcribing and translating interviews to capture important information relevant to the scholarship.

3.1 Research framework

The study involves examining both primary and secondary data. Initial research requires the collection of secondary data from literature covering multiple resources: published texts mostly from books, monographs and journals, surveys, handbooks and relevant governmental legislation and guidance from other organisations. Other resources include articles and seminar papers concerning the study of Malay crafts, craftsmanship, skills and knowledge production or reproduction.¹⁶⁹

Heritage research from other countries is referred to, especially from a Western context, in order to examine the theoretical framework and techniques implemented. These resources include comparative dimensions that are distinctive, but may provide a rubric applicable to the study of Malay house building culture. In the concept of craftsmanship, the writings of Richard Sennet, Adamson and others are

¹⁶⁹ Due to the nature of information relating to Malay crafts, or as any other historical information within South East Asia, the sources are limited in literary text. This is due to a strong oral culture and passing of knowledge through other means such as practices. Nonetheless, some of the secondary data collected was derived from records written by Western scholars prior to Malaysia independence.

considered. Craftsmanship is defined in this context by the attributes of past craftsmen's skills and thoughts such as in the quality of the handmade, the nature of perfection, and material consciousness.

Understanding theories of the building craft and its poetics serves as the foundation to understand Malay 'craftsmanship' or 'workmanship'. Hence, the relevance of existing craft definitions are significant to the groundwork of the theme of inquiry when the need to restore Malay heritage legacies is being perpetuated in this study. Nevertheless, while the idea of 'craftsmanship' within Malay cognition is still indefinite, minimal or progressing, it is valuable to incorporate materials that are not just relevant but morally significant towards this milieu. Hence secondary data collection derived from literature assists in understanding where notions of craft are assumed or misinterpreted, and justifies the exploration of a key process within Malay building culture; disassembly and assembly.

In this study, the definition of Malay craftsmanship requires understanding a set of concerns. Arguments absent from existing literature are developed from the Malay cultural standpoint, thus the culture and worldview of its people are central. Similarly, the study of architectural heritage, particularly in Malaysia, should not only be sought from static artefacts such as buildings, but in reference to the landscapes and natural systems in which they are associated with (Rapoport, 1999, p. 60). Having said that, Malay *tukang* are introduced as the subject matter on account of their opinions and interpretations. It is in the best interest of the fieldwork to treat the *tukang* as the bearer of knowledge and practitioners of their heritage. This is owing to the *tukang's* ownership of individual practice of Malay culture, which is reflected in their theories-in-use¹⁷⁰. The technique for collecting primary data from these *tukang* is via documentation of what and why people do, within the context of what they know and think (Brookfield, 1996).

¹⁷⁰Theories-in-use or could be described as theories-in-actions, are a set of principles that guides *tukang's* actions rather than purely based on their beliefs or ideals. See Cuff, D Architecture: The story of practice, MIT Press, Cambridge, MA (1991).

The study adopted the use of unstructured interviews, with *tukang* and other subjects who are directly involved in the process of building traditional Malay houses (Refer Appendix 1). A *tukang* here is defined as a person who builds Malay structures such as houses or *wakaf*¹⁷¹ although the word is broad in meaning¹⁷². Meanwhile, the other subjects proposed for the interviews include academics, antiques collectors, government officials or experts. The selection of subjects - especially other than *tukang* - took into consideration their ability to provide insights beyond the practice and conception of the 'builder' or the maker.

Although the notion of craftsmanship dwells deeply within the arts trade¹⁷³, it can be argued that Malay houses are partly an artistic endeavour, albeit concerning the relationship between technical skills and spiritual within Malay culture. This suggests that the definition of craftsmanship within the study, although vague within different trades and crafts, can be fundamentally defined by common aspects of Malay building culture, such as the large scale of building craft, detailing that is considered 'rough' rather than intricate (ie. *Kris* or woodcarvings), and the significance of rituals that emphasise the surroundings, and the inhabitants of the house, especially the mother.

To embrace the topic further, the role of *tukang* in a contemporary context is considered to be a combination of a craftsman, builder, architect and artisan in reference to their actions and responsibilities. As existing descriptions of craft, craftsmanship and knowledge production (or knowledge transfer) are subjective and ambiguous, understanding the complexity of the role of the *tukang* in the past and within contemporary building culture is important, particularly in relation to skills and knowledge tradition they uphold. It is crucial for the literature



Figure 3.1 *Wakaf* structure is a smaller scale of a Traditional Malay House, utilising similar *tanggung* connection system. Source: Author, 2015

¹⁷¹ The word *Wakaf* is from the Arabic language meaning endowment, specifically a dedication of a property for charitable purposes. In the Malay terms, it relates to a small structure (similar to a gazebo) employing a similar technique to Malay house-building. It could have meant the same with the Arabic meaning, as *wakaf* are normally placed in public areas and utilised for public asylum from the hot sun and rain.

¹⁷² Refer section 1.1(iii) and 4.1 for explanation.

¹⁷³ Similar to the 'Unity of Art' within Arts and Crafts movement – it was created to signify the importance of architecture as part of the artist community (Crawford, 1997). In the same way, craftsmanship is often related to crafts performed by local artisans and utilising hand skills and small productions, rather than an 'architecture'.

and information collected from the fieldwork to record the existing body of knowledge within Malay building culture, which in turn echoes the main research question, concerned with the fundamental concept of craft and knowledge production in an age when traditional builders within the culture are scarce.

The methodological framework in the study is characterised by Franz (1994) - incorporating both conceptual and philosophical-orientated research. Conceptual research in architecture was described by Franz as a, 'psychological frame-of-reference' and, 'a person-environment frame-of-reference'. In relation to the psychological frame-of-reference, Franz defines the methodology as a process that draws on past design experience, utilising rational and creative reasoning from the research respondents (i.e. *tukang*). He emphasised the term 'rational'. This is relevant to the process of enquiry undertaken in this study, linking contemporary problems with the experience born out of the *tukang's* creativity, thinking and historical context. This approach involved different types of knowledge: 'representational knowledge, transformational knowledge and procedural knowledge' (ibid, p.438).¹⁷⁴

Malay culture relies on the surrounding environment and moreover social rituals for its dynamism, reflected in the actions and thoughts of its society. Therefore the conceptual-orientated research in 'a person-environment frame-of-reference' methodology addresses the need to comprehend culture and social norms within the Malay community. In understanding the context of a place, Franz (1994) emphasises the importance of environmental, cultural and social constructs that determine an individual's reality and behaviour. In the case of Malay building culture, the site, spiritual association of living objects, belief and ceremonial activities define the actions and rituals within the house-building process. As such, the form of the house and procedural undertakings by the Malay *tukang* are the results of this.

Philosophical-orientated research reflects the, 'ontological frame-of-reference' which according to Franz (1994), is relevant to hermeneutics

¹⁷⁴ Franz (1994) quoted Akin (Akin, O, Psychology of Architectural Design, Pion Ltd, London, 1986) in describing the problem-solving process as three distinct activities: 'problem representation; problem transformation utilizing a particular body of knowledge; and, searching, which involves the designer in matching resources (knowledge) with the task at hand'.

and phenomenology in architecture. A significant element of the methodology in this study - recording the thoughts and actions of the *tukang* - involves constantly negotiating between, 'what is expected and what is presented in the situation' (Franz, 1994, p.440). In essence, the experience and interpretative process of the *tukang*, prior to and after conducting the disassembly and assembly process, should be considered appropriate data for the study. As a result, the interviews conducted in this study comprise questions concerning the personal opinions and values of the *tukang* relating to their practical understanding and awareness in the Malay house-building process.

Meanwhile, as the study deals with the building process or indigenous 'construction' as part of the investigation, the aspect of technicality in the study should also be taken into consideration. The literature suggested a unique feature of the Malay building culture, which is the *buka pasang* or the process of disassembly and assembly. An important feature of the Malay house is that the technique is based on years of evolution and development as well as trial and error. The study examines this approach applied to house 'design' that emphasises procedure: the building techniques and the aspects of ritual traditions. Again, this may relate to Franz's (1994) description of an approach that is technically-orientated but, 'with a systematic frame-of-reference'. Primarily, the methodology stresses the element of procedure as part of the design being examined, which is based on the desire to, 'achieve fitness between two entities; the form in question; and, the problem situation' (Ibid, 1994. p.437) - ultimately related to the requirements of Malay culture.

In short, the study aims to develop a, 'hermeneutic idea of interpretation and meaning' (Franz, 1994), implemented within the study of Malay building culture. The study suggests a qualitative methodology that includes conceptual, philosophical and technical approaches in order to acquire an understanding of a building process that is people, culture and procedure-orientated. More importantly, as Malay culture progresses, contemporary understanding of the building culture and people's perceptions should also be given equal consideration to historical literature.

3.2 Field Work investigation

The methodology encompassing qualitative research practice examines the ethnography of Malay *tukang*, craftsmen or carpenters with interviews and observations as a method of enquiry. The study acknowledges the large amount of literature available regarding the general process of building the Malay house, but has identified a shortfall in literature concerning the reconstruction of the house from post-occupancy, including the disassembly and assembly process. Moreover, the available text lacks detailed analysis of the people involved in building Malay houses. Although it may be possible to speculate about Malay *tukang's* technical understanding from the existing literature, spiritual aspects of cultural heritage are absent.

Therefore, data pertaining to the spiritual as well as physical workmanship of Malay building participants will be collected as the practical fieldwork research is conducted. By visiting the subjects, and observing them directly on-site, the author will obtain first hand experience of *tukang* practice as it relates to the research hypothesis.

3.2.1 Observations

Recent understanding of ethnography especially in observational fieldwork (sometimes known as field and participant observation), relies on physical and spatial participation on-site with the research subjects, mainly the *tukang*. Ortner¹⁷⁵ and others advocated the idea that the author should acknowledge his or her role as an agent of knowledge from site visits conducted - which may involve facets of self-understanding and interpretation. Though this concept mainly relates to a rigorous observations in anthropology studies such as in the works of Trevor Marchand¹⁷⁶, the body becomes a central element in the

¹⁷⁵ See: Ortner, Sherry. 1995. Resistance and the Problem of Ethnographic Refusal. *Comparative Studies in Society and History* 37 (1): 173-193.

¹⁷⁶ Marchand (2012) describes the advantage in deep anthropological research from his book; "...in this exchange of 'toil' for 'ethnographic knowledge' (as well as craft skills), my physical contribution offers me privileged access to my co-workers' practices and their expertise. A regular schedule of long hours, and engagement in what are often repetitive manual tasks, permits repeated observation leading to a more detailed understanding of both artisan techniques and the modes of communication involved in teaching and learning skills."

knowledge production. "... [The] deployment of the researcher's body as a living, physical, sensing and experiencing agent enmeshed in practical and intimate encounter..." (Retsikas, 2008, p.127)¹⁷⁷ legitimises the physical presence of the author in the fieldwork as a form of discovery and inquiry. However, it may be argued that in conducting observations, the aspect of 'body' will also be reflected in the research subjects, particularly the *tukang* whom the author will mostly engage with, hence knowledge production is a two-way relationship. Ultimately, observation is a feasible method in contemplating the process of making that is primarily somatic as it provides a, 'window onto human spatial cognition' (Marchand, 2012, p.175-176).

The importance of the body is pertinent as the investigation to study Malay building culture relies on physical interaction with the subjects, the objects (Malay houses) and others: users, visitors or even observers are all important aspects of the building process¹⁷⁸. However, there were challenges within the research, such as the limitation in both the time and ethnographical intensity, due to limited building conservation or construction activities of traditional Malay houses.

Nonetheless, the shortfall in research intensity can be compensated for by the depth of 'desk literature' investigation coupled with the intention to approach non-craftsmen such as academics, conservators, antiques collectors as well as individuals involved in Malay building cultural heritage. This is due to the opinion that a definition of *tukang* as an artisan or a master in a specific trade, shares a common ground on the principles of a Malay culture, albeit holding different responsibilities and tasks.

¹⁷⁷ See: Retsikas, Konstantinos. 2008. Knowledge from the Body: Fieldwork, Power and the Acquisition of a New Self. In *Knowing How to Know: Fieldwork and the Ethnographic Present*. Edited by Narmala Halstead, Eric Hirsch, and Judith Okeley, 110-129. London: Berghahn.

¹⁷⁸ The Malay building process is not in isolation between a *tukang* and the house-owner, but is a communal endeavour that comprises collaborative effort of people and workers with different sets of skills within *kampung*. It is depicted in relation to the *gotong-royong* activity.

3.2.2 Interviews

'The goal of man-environment studies is the development of design objectives and hence criteria for choice... It should provide insights into what to do: one can then evaluate design not only in terms of whether stated objectives have been met. but also in terms of whether the objectives are valid in the first place. This is the ultimate goal of a new theory of design, based on man-environment studies.'

Ultimately, what I have sketched out here briefly is meant to help change the way designers look at the world, at people, at design - at what they do. Only by changing this fundamental outlook can one change the way one designs independently of specific information, programming methods or whatever. New methods or new information will not change design if attitudes do not change. Changing attitudes requires a redefinition of what design is all about. This redefinition is long overdue.'

- Rapoport, 1984

Interview methods will be used in support of observations. The study adopted an unstructured interview technique to give the interviewee flexibility to express his or her own thoughts in regards to the subjective matter of the building culture. The subjects were chosen based on familiarity with the Malay house building culture, Malay skills and knowledge creation or in the Malay crafts. The questions employed are both closed and open-ended in order to provide a general understanding of the topic while at the same time to gather more detailed responses from the subjects.

Adopting an unstructured interview technique, according to Becker and Geer, (1957, p. 28) permits the study to, 'explore many facets of the interviewee's concern,' particularly with regards to the aspects of Malay craft, skills, knowledge and issues of transmission. Accordingly, relevant questions can be introduced spontaneously - 'pursuing interesting leads' and in order for the *tukang* to articulate his answers fully.

Since the topic is partly historical in nature, it is expected that the interviewee will include their oral histories as this is unavoidable. However, it is acceptable as it could explain the development as well as

the context of the subjects in relation the study. In particular, the study anticipates that oral history from self-experience of what was thought or passed down from previous generations will be significant. Bornat (2004) advocates the advantage of oral history in social sciences as it opens up a multidisciplinary approach to data analysis, enriching interpretations between past and present and thus acknowledging situated subjectivity within research. Moreover, she adds that it demonstrates, 'how individual agency (..) interacts with and serves to mediate and moderate the broader structural determinants of society today and in the past' (Bornat, 2004, p.44).

3.2.3 Phenomenology and rituals

Describing Malay house building culture from current literature merely summarises descriptions of what others have observed. This is mainly through the lens of researchers or observers, which may rely on their preconceived notions and judgments. Therefore, the interviews conducted permit the opportunity for a more insightful look at Malay building culture through the perspective of the inheritance of traditional skills and knowledge. The substance of the Malay house and its building culture should not be looked upon as simply a cultural or vernacular phenomenon (or tradition), but includes multiple aspects encompassing the reality of the lives of different individuals within the living world; the everyday life.

The inquiry into concrete and existential dimensions or 'phenomenology' or to refer Marchand's specific approach of 'hermeneutic phenomenology' (Marchand, 2012, p.ix) is significant within a practical Malay house-building culture. The composition of 'things' and how architecture is made reinforces the idea of a reality of existence; hence the maker - in this case the Malay *tukang* - should be celebrated by incorporating manifestations of their existence within the building process.

Phenomenology according to Norberg-Schulz is conceived as 'a revert to objects or things'¹⁷⁹ rather than as an abstraction in scientific analysis and concepts. Therefore this study of Malay building culture examines

¹⁷⁹ Christian Norberg-Schulz, *Genius loci: Towards a Phenomenology of Architecture*, (New York: Rizzoli, 1980), pp. 5-8.

the real-world practices of Malay *tukang* and how they are understood, interpreted and exercised within the realm of practical knowledge production or transmission. Consequently, the experiences of the Malay *tukang* are crucial to the study. This may include their experiences in the building process, inherited or learnt, which may incorporate knowledge and skills in materials, procedures and techniques.

Other aspects such as spatial experiences within Malay houses could potentially provide responses that a 'layman' and particularly the author could not comprehend from observations alone. By emphasising the existential dimension from the experiences and physical involvement of Malay *tukang* within the building culture, the study anticipates an emphasis on historical notions that defines who they are, why they do, what they do and how they do it. More importantly, it is necessary to explain the symbolic meaning behind the building processes the Malay *tukang* engage in. In the case of Malay building culture, the disassembly and assembly process is central and forms the focus of the study.

Heidegger's concept of 'dwelling' as explained by Norberg-Schulz is when a person orientates and identifies themselves within an environment, thus defining it to be meaningful. It is also similarly presented as ritualistic, creating symbolism in object form as well as in making processes that could shape meaningful life experiences of a man. Rituals and symbolism are synonymous with the Malay building culture, hence phenomenology helps to define the understanding of rituals and symbolism within a, 'concrete and existential dimension'. While the study anticipates a decline in ritual and symbolic belief in relation to spirits within the contemporary practice of Malay building, what remains of inherited rituals should be observed.

3.2.4 State of Terengganu

This research will be conducted in Terengganu, an East Coast State within Peninsular Malaysia. Terengganu was selected based on its significance as one of the cultural centres of Malays in Malaysia, and is known to have a mature identity in Malay cultural heritage. Similarly to Kelantan, Terengganu is recognised as a Malay enclave, in which there are many aspects of indigenous and ingenious Malay knowledge ranging from boat-building, blacksmiths, silversmiths, batik, weave embroidery and more. At present there remain some communities or individuals

who actively continue to preserve and develop traditional know-how, including in the Malay house-building. The architectural style displays the influence of Kelantan and Pattani (a southern region of Thailand), which in the past is part of the same lineage of culture, but buildings in Terengganu generally have modest forms, only sometimes embellished with intricate and curvy profiles.

Furthermore, Terengganu has a strong history in timber boat-building with local boat craftsmen or *tukang* said to be particularly valued. The boat *tukang* has skills in building timber deep-sea water boats that can withstand big waves, and in comparison to contemporary aluminum or composite construction, traditional boats are still preferred by local fisherman today. Similar to the traditional house-building trade, boat-building is on the verge of extinction, but unlike traditional houses, boat-building is more complex. Boat-building requires knowledge and skills beyond house-building that relates to the physics of equilibrium and marine constraints.

“Malay traditional boat-builders can always build houses, but house-builders are not always a boat-builder”

A popular proverb is: ‘Malay traditional boat-builders can always build houses, but house-builders are not always a boat-builder’, and conversely, this suggests that boat *tukang* are more skillful than house *tukang*. It is probable therefore that many boat *tukang* in Terengganu are also house-builders: adding to the number and excellence of *tukang* who are capable of building houses in Terengganu. Historically, boat-builders employed teak wood, known for its strength and quality, which is also popular for building Malay houses.

An anecdotal survey may find that there is still evidence of traditional Malay houses standing in Terengganu - more than in any other state - possibly due to the teak timbers utilised, though this could not be proven statistically. However, with the abundance of teak material once used as house-building material in both structures and ornaments in Terengganu, the amount of houses and available artefacts that could possibly be conserved here is greater. The preservation of Malay building culture is evident in the many conserved traditional houses and boats in the compound of the Terengganu State Museum. While these artefacts were preserved for museological purposes, it demonstrates an attempt to sustain local cultural heritage by the Terengganu administration. In addition, with current and ongoing conservation

projects such as Losong Haji Su house and Terrapuri village, Terengganu is an ideal context for this study.

'Indeed, it's heartening that heritage at Terrapuri is being celebrated on a deeper level beyond architecture, by delving into ancient carpentry..' (Sia, 2012)



Figure 3.2 Terrapuri Heritage Village consists of 29 traditional Malay structures that are re-built using the same traditional techniques. Source: www.terrapuri.com/the_village_resort_07.jpg.

Terrapuri, meaning the 'Land of Palaces' is probably among the most important projects within the study of Malay houses. This site was created by an antique collector, Alex Lee, as a hobby, which later escalated to become a centre for conservation and restoration of abandoned traditional houses. It further developed into a heritage-themed boutique resort business and currently consists of 29 Malay structures repurposed to accommodate modern facilities. The outcome represents more than 20 years of planning and rebuilding Terrapuri village, hiring local craftsmen and workers, providing them with a unique opportunity to be directly involved with traditional artefacts of diverse ages and scales. Old Malay structures were rescued from *kampung* that otherwise would have been demolished or fallen into ruin. The conservation process has been possible not only because traditional houses are made of extremely durable teak or *cenghal* wood, but more importantly, because they can be 'dismantled and reassembled' (Sia, 2012). Equally important, Terrapuri village provides an opportunity in the continuation of craftsmanship skills and knowledge to existing Malay *tukang* such as *Tukang Azih* and *Tukang Jamal*; who are included as subjects in the study.

3.2.5 *Tukang* and Other Building Participants

Finding the *tukang* to participate in this study has been a meticulous task. In the past, Malay *tukang* were usually known only within their vicinity or *kampung* as house-building represented a small-scale rural industry limited within its community. Similarly at present, searching for a *tukang* who practices the traditional trade is difficult,¹⁸⁰ a challenge exacerbated by the location of the author in Sheffield. The lack of web or social media presence prevented the author from quickly identifying

¹⁸⁰ In building his house to adopt the traditional Malay built techniques, Salinger sets out to a specific village in Kelantan and asks the local postman of an individual *tukang* he intend to seek. The house known as Rudinara house, designed in June 1985 and completed six years afterwards in June 1991 has since won the Aga Khan Award for Architecture in 1998. See Salinger, R., 2007. *Rudinara: The Story of the Handmade House*. Marshall Cavendish Editions.

potential *tukang* available for the study¹⁸¹. However, conservation projects of Malay structures such as Terrapuri and Losong Haji Su in Terengganu provided an opportunity as specialist teams of local craftsmen usually emerged from these activities. Meeting the *tukang* require personal site visits in 2014 and later in 2015 to obtain further information from the *tukang* and follow any leads, pointing to other *tukang* who were available to participate.

Attempting to contact a *tukang* from Sheffield was found to be unsuccessful. For instance, available data on Terrapuri village pointed towards a Malay *tukang* named Alwee Abdul Rahman.¹⁸² Rahman and his son Alhuzaiqi Alwee - his apprentice - still work as the resident craftsmen attending maintenance works. However, while visiting the site both *tukang* were not available, and Alhuzaiqi, the son or apprentice had been working elsewhere.¹⁸³

¹⁸¹ In the course of this writing, some Malay *tukang* have been identified within the social media. The platform provides the *tukang* to share ideas, images of their craftsmanship and to promote their business.

¹⁸² Alwee has been a carpenter since the age of 13 following in the footsteps of his father and grandfather, whom were wood workers for boats and houses. Therefore the lineage points to a possible continuation in the skills and knowledge within the family.

¹⁸³ It was revealed that Alhuzaiqi went to follow his uncles working as deep-sea fishermen. This points out interesting points: the nature of apprenticeship occurred from hereditary and a typical occurrence of past social life where carpentry is common and the occupation alternated with the seasons. In dry seasons, young men will go out to sea while on rainy days, they will attend to carpentry. However, this could somehow contradict with the suitable time of year to build houses and the quality of wood, which is affected during wet seasons.

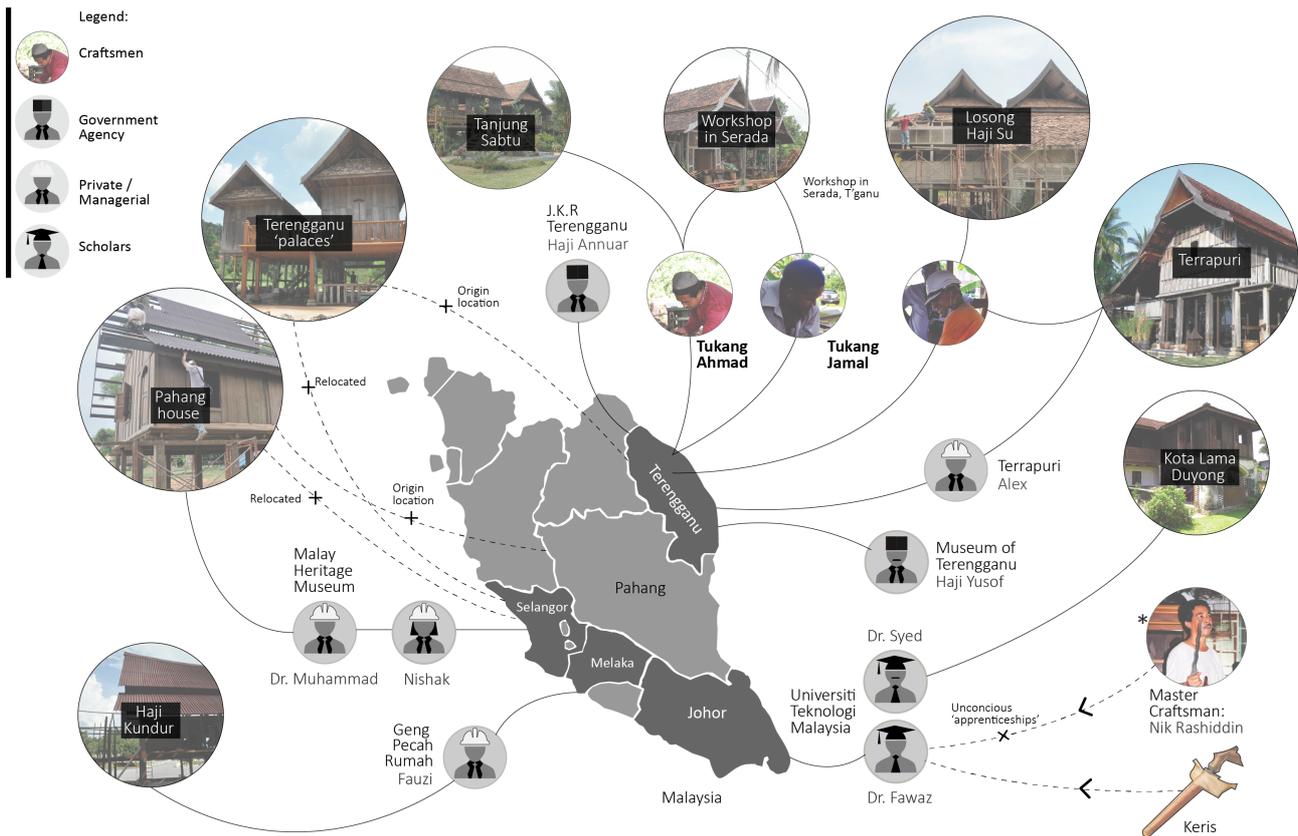


Figure 3.3 Diagram of people involved in the study, their associations and location within Peninsular Malaysia. Source: Author, 2018

Most of the *tukang* who agreed to participate are situated in Terengganu. Initial fieldwork visits had secured *Tukang Jamal* and his partner *Tukang Ahmad* as they currently work within the same establishment. Another *tukang* by the name of *Azih* was identified through the *Losong Haji Su* house conservation project. With the permission of *JKR Terengganu*¹⁸⁴, the author spent time here observing some of the processes encountered in the current traditional building culture. As the study attempts to generalise the context of the term traditional Malay house building culture, other local *tukang* outside Terengganu were sought. In 2015, a second visit to Malaysia brought the opportunity to locate another conservation project in Port Dickson, within the state of Negeri Sembilan. Similar to other conservation projects encountered during the research, this project employs only

¹⁸⁴ The author was indebted towards Mr. Wan Hafiz and Mr. Hilmi for their guidance and assistance in providing information, contact details and instigating more references to *tukang* and conservation projects in Terengganu.

foreign *tukang* from Indonesia¹⁸⁵. Fortunately, the study benefitted from a meeting with Fauzi, an experience conservator who had worked on and even managed traditional building restoration. He is currently supervising workers in this conservation project.

It is also worthy to note an important factor for determining the selection of *tukang* as well as other subjects within the study, is the nature of their involvement - direct or indirect - in the construction of traditional Malay houses. In particular, the study has identified Malay *tukang* (or modern Malay *tukang*) who still practice the trade of building traditional structures, such as Tukang Azih, Tukang Jamal and Tukang Ahmad, who all have years of experience and are currently engaged in different scales of projects. The projects range from conservation of traditional houses or resorts, constructing *wakaf*¹⁸⁶ structures, furniture-making utilising traditional techniques, and building new or conserved traditional house commissions. In essence, interviews with and anecdotal evidence from these *tukang* is of great importance, while other subjects such as Alex, Dr. Syed and Dr. Fawaz can verify or add information or justifications to the findings.



Figure 3.4 Images of main *tukang* as research subjects. From left: Tukang Azih, Tukang Jamal and Tukang Ahmad. Source: Author, 2014

¹⁸⁵ Dr. Muhammad, the director of the Malay Museum in University Putra Malaysia had similar problems when conducting house conservations within the museum compounds. He informed the author of the lack of local *tukang* within the vicinity of his place in Negeri Sembilan state located south of the capital Kuala Lumpur and north of Melaka state.

¹⁸⁶ A shelter without walls, similar to the construction of traditional houses but is simpler in techniques due to its smaller size.

3.2.5.1 *Tukang Azih*

The first tukang encountered was *Tukang Azih*, a self-taught *tukang* who was involved directly with the Terrapuri village project since its inception. Along with his brothers and relatives, he was commissioned by Alex, the owner of Terrapuri, to dismantle, reassemble and conserve old houses at Terrapuri and this experience led him to establish his own building craft business specialising in the same tasks. One of his latest commissions is the Losong Haji Su house conservation project to conserve a traditional house for a new museum in Terengganu, which was in disrepair. The project was awarded to a main contractor where *Tukang Azih* and his team of craftsmen became the sub-contractor. Prior to the engagement at Terrapuri and Losong Haji Su house, *Tukang Azih* disclosed an interesting find: he was not a traditional house-builder before, however he had the skills to build boats. This may partially prove the idea that boat *tukang* can always build houses, though he is only capable of building small boats rather than a size akin to a house. However, the tasks of conserving more than ten houses in Terrapuri (and other projects with different proportions) has taught him how to build, but more importantly - in learning past assembly techniques.

3.2.5.2 *Tukang Jamal*

Tukang Jamal, also identified as *Ustaz*¹⁸⁷ *Jamal*, is a well-known master-craftsman with the ability to use traditional '*pasak kayu bulat*' or round timber *pasak*¹⁸⁸ technique, a method used for Malay house construction which can also be generalised as the *tanggam* connection system. He studied the art of carvings and making hilts for *Keris* by a famous master-carver, *Tengku Ibrahim Tengku Wook*, who specialised in traditional carvings, ornaments and weaponry. *Tukang Jamal*'s passion has extended into buildings, which he claims to have shifted into building traditional structures after a lengthy process of self-practice. Furthermore, his works in carvings taught him how to be meticulous with his details, hence a high level of precision could be maintained in the transition between a small-scale artefact such as the *Keris* to a large-scale house.

¹⁸⁷ *Ustaz* is a Malay word for religious teacher.

¹⁸⁸ A wooden peg used to hold timber parts together.

Tukang Jamal's woodworking workshop, *Pasak Pertukangan Kayu*, employs at least four workers under his leadership. In addition to timberwork commissions from Terrapuri during its earlier establishment, the workshop is currently occupied with projects varying from traditionally inspired furniture to wall carvings and building conservation. It is reasonable to assume that Tukang Jamal receives more commissions on building *wakaf* structures using traditional techniques and reclaimed wood, as it is always in constant demand. Although he employs traditional techniques, he was provided with modern timber machining tools by the government in 2004 to continue his passion. He comments that having modern tools makes their work faster as the end product is more significant, but more importantly the structures are built and assembled as per tradition.



Figure 3.5 Tukang Jamal (left) and Tukang Ahmad (right) on one of the building conservation sites. Source: Author, 2015.

3.2.5.3 Tukang Ahmad

Tukang Jamal's companion or partner in the trade is Tukang Ahmad. Similar to both Tukang Jamal and Tukang Azih, Tukang Ahmad started his career in building traditional houses in 1992 during his involvement in the *Tanjung Sabtu*¹⁸⁹ conservation project owned and instigated by Ku Ismail. Years of experience in the project exposed him to other

¹⁸⁹ A private conservation project in Terengganu consists of a few houses used for a retreat and an art gallery. However, it is now been abandoned after the owner, Ku Ismail passed away.

experienced *tukang* or *awak-awak*¹⁹⁰ working alongside him, and has taught him about the world of traditional Malay architecture based on oral conversations, observations and reflections, and his own labour. *Tukang Ahmad's* technical proficiency lies in the marking of building components prior to assembly, providing an interesting revelation in the ways that timber components are identified and located throughout the Malay building and assembly process.

3.2.5.4 Other *tukang* and workmen

The author's failed attempt to meet *Tukang Sulong*, also known as *Pak Sulong*, for an interview due to his health condition was unfortunate, preventing the study from considering first-hand evidence from craftsmen in different trades to house-building. However he is still worth consideration. *Tukang Sulong* has been a boat-builder since 1977, and currently owns a marine workshop, repairing and maintaining timber and aluminum boats. He learnt from his uncle, who was also a boat-builder, and at present, his two sons are running the workshop. *Tukang Sulong* has the capability to make decisions about the design and timber requirements for large deep-sea boats without having to use technical blueprints, hence he strictly supervises the building works on site.

The brief conversation the author had with *Tukang Sulong* focused on his ability to make judgments intuitively without modern-day calculations or technical procedures. Although he was not able to articulate his reasons, his reply was consistent and typical of craftsmen worldwide; "it was from his heart". *Tukang Sulong* was occasionally said to consult and advise on modern boat-building techniques from neighbouring marine workshops. This is an interesting point of the study that challenges the idea of the obsolescence of traditional knowledge passed down orally, which is still relevant in the current age of mechanical and digital production.

Tukang Sulong and his sons were the *tukang* in charge of rebuilding and conserving the trade boat owned by *Haji Su* (the previous owner of *Losong Haji Su* house, conserved by *Tukang Azih*), which is now located in the compound of the *Terengganu State Museum*.

¹⁹⁰ 'Labourers' in Malay, but it can be meant to describe apprentices or *tukang* that had years of experience.

Subsequently, Encik Fauzi who is involved with the heritage house of Haji Kundur conservation project is relevant to the study as he has broad understanding in the supervision and practical work of disassembly of Malay structures. Ranging mostly from Negeri Sembilan and Melaka state houses, his expertise lies within these two states where most of the traditional structures dismantled were used as building parts for other construction undertakings - although this may contradict the study's proponent to the Malay house conservation. However, the aspects of historical and applied knowledge Fauzi displays helps to provide information in relation to conservation practice and the abstract and practical notion of Malay building culture at present.

3.2.5.5 Researchers and Academicians

The limitations in the search for *tukang*, as described above, restricted the study within Terengganu state and its local architectural style, however the research expanded to consider other personnel involved in the trade of building traditional Malay architecture. This includes proprietors, academics and antique-dealers who have the background, knowledge and association with the topic or related matters. Academics such as Dr. Syed Iskandar and Dr. Fawaz Khair are experts and have conducted extensive research in traditional Malay cultures, crafts and architecture, thus providing critical academic arguments on the topic. In regards to his comprehensive thesis on Malay houses¹⁹¹, Dr. Syed's experience in conservation projects as consultant or advisor, such as the conservation of *Pulau Duyong* and *Penghulu Abu Seman* house in Terengganu and Kuala Lumpur, suggests extensive involvement in managing conservation projects within a Malaysian context. At present, he is currently overseeing indirectly the preservation works of Istana Sri Menanti.¹⁹²

Meanwhile, Dr. Fawaz is a Malay craft enthusiast, investigating the highest order of Malay craft, the *Keris*, a Malay symbol and a weapon. His experiences and knowledge with craft of this calibre has led him to

¹⁹¹ See Ariffin, S.I., 2001. Order in traditional Malay house order form. Oxford Brookes University.

¹⁹² Istana Sri Menanti is a Malay palace located in Negeri Sembilan. It is one of the spectacular Malay structures of Minangkabau architectural style where its significant feature is the multi-level floor spaces made of out of wood and utilising the *tanggam* system.

meet master *tukang* who are well known for their skill within Malaysia as well as in Thailand. He had a close acquaintance with the late Nik Rashidin, a prominent carver and advocate of traditional Malay cultures and artefacts including the Malay house. His affection and passion towards Nik Rashidin has proved to be worthwhile for the study, providing insights on how knowledge transfer is acknowledged or even interpreted within Malay culture.

3.2.5.6 Museum curators

The opportunity to meet museums directors was crucial to understand the aspect of heritage from a museological perspective, while understanding the pressures faced by the heritage industry. Individuals such as Haji Mohd Yusof of Terengganu State Museum, and Dr. Muhammad and Miss Nishak of the Malay Heritage Museum in Universiti Putra Malaysia (UPM), offered information related to current state or museum policies and issues pertinent to Malay history, its heritage and traditional artefacts that shape the history of Malay culture especially in the built environment. Subsequently, with Dr. Muhammad's extensive experience in the conservation of traditional Negeri Sembilan¹⁹³ houses, this provided evidence relating to Malay *tukang* from other states, permitting further generalisation of Malay craftsmanship and house-building culture.

3.2.5.7 Antique collector and proprietor

Besides Dr Muhammad, Mr. Alex Lee, the owner of Terrapuri village, is also a heritage enthusiast with a similar approach in dealing with traditional artefacts: aiming to save endangered Malay heritage and at the same time as a profitable venture. It is the desire to promote traditional cultures that fuelled their affection towards local cultural antiquity, an advantage to the research in explaining heritage issues beyond the traditional built environment. The relevance of Malay culture in the study encompasses the idea of issues of economy, social structures and even Malay scriptures, which provide anecdotal evidence that is commonly unscientific and subjective.

¹⁹³ A state with the architecture influenced and associated with the people of Indonesia from *Minangkabau*.

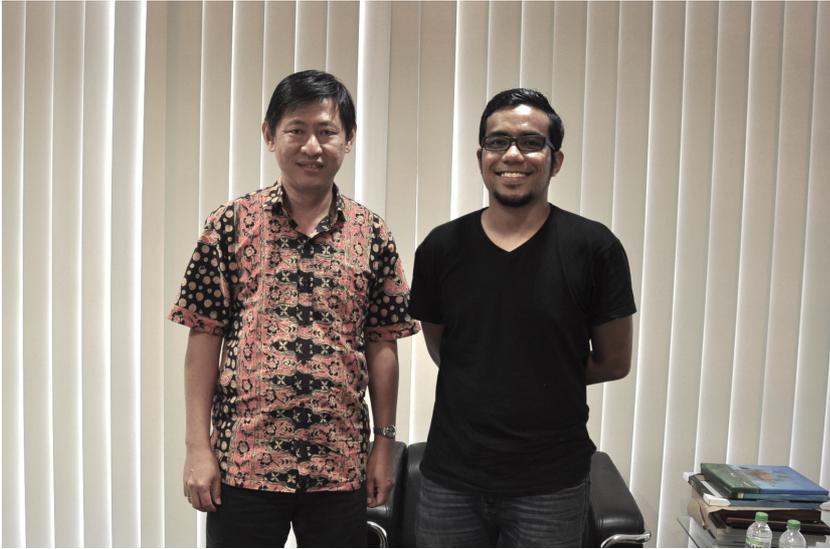


Figure 3.6 Alex from Terrapuri (left) with the author during the interview session.
Source: Author, 2015

Research Subjects	Mentioned names
Jamalias bin Ismail	Tukang Jamal
Azih bin Abd Rani	Tukang Azih
Syed Mohd bin Hanafiah	Tukang Ahmad
Fauzi bin	Fauzi
Dr. Fawazul Khair bin Hj Ibrahim	Dr. Fawaz
Dr. Syed Iskandar bin Syed Arifin	Dr. Syed
Dr. Muhammad Pauzi bin Abd. Latif	Dr. Muhammad
Mr. Alex Lee Yun Ping	Alex
Cik Khairul Nishak binti Harun	Nishak
Tuan Haji Mohd Yusof bin Abdullah	Haji Yusof
Ar. Hj. Mohd. Annuar bin Dato` Ngah	Haji Annuar

Table 1 List of research subjects and their mentioned names throughout the thesis. Source: Author, 2015

3.3 Analysis

The process of conducting interviews and observation work took place in tandem to provide a fair judgement of the hypothesis. As craftsmen were known to have limitations in verbal articulations of their actions, observing the visual or physical actions could substantiate any ambiguity in the interviews. Therefore the field observation enabled the study to make direct use of any evidence from the *tukang's* actions to fill any gaps found in the interviews. When the feedback from the *tukang* was

limited, observation enabled the author to make, 'educated guess[es] about the things which go unspoken' or that could not be explained, thus, 'making the most of the little,' hints the author acquired to form concrete justifications (Becker and Geer, 1957, p. 30).

Moreover, while the open-ended interviews adopted may not have provided complete results to form a hypothesis, the author could pinpoint certain aspects of the incidents observed on-site for clarification. The study included site visits to observe the *tukang* on-site, while they worked on Malay houses, including intermediate or prompt interview sessions. These sessions were conducted in a safe environment when the author and the subject felt it was safe to do so.

The interview data was analysed and carefully crosschecked with the actions of the *tukang* on-site, the literature and justifications from other subjects (non-*tukang*). In addition, interpreting bodily movement and verbal language required both imagination and care in order to understand meanings as well as identifying the facts. When interviewing subjects with different dialects from the author, discrepancies were investigated supported by the use of photography and audio recording tools to capture overlooked information. This also aided the transcribing process.

3.3.1 Transcribing and Translation

The fieldwork was conducted in the Bahasa Melayu or Malay language, mainly during the interview sessions with the Malay *tukang*. Malay was used alongside English with other interviewees in order to create an informal atmosphere while including the appropriate terminology used to describe elements within the building culture. The use of *pasak* or *tanggap* is synonymous with the Malay house-building process. Similarly, the words *bina* and *pasang*, literally translated as construction and assemble, are often preferred when describing the honest actions of *tukang* in dealing with building artefacts.

In the same way, some Malay words are best employed to portray something of significant value, mainly related to Malay culture. One example is the use of the word *tukang*, translated as craftsmen. However, the author will adopt a meaningful English word when it is

viewed to portray ethical connotations, which is reflected upon cultural Malay customs.

Another challenge within the study is to translate and transcribe the interviews. The author may tend to polish sentences to suit his purposes (Nabokov, 1941). Having preconceived ideas of what was spoken and what it meant must be validated with participant observations. However, if the author misjudges the meaning due to the absence of what can be observed, it is fair to rely on the literal meaning of what was said rather than trying to fit assumptions.

On the contrary, there are shortcomings in using literal translations. The spoken Malay language can be simple and direct and may require connecting words to describe the actions or the intent in sentences. In the same way, the translation may have to be paraphrased and given structure to be comprehensible. Nonetheless, in most cases, the translation is as simple and direct as possible, with minimal paraphrasing to communicate the issues raised clearly. Some examples of translations from the interviews - with partial English words - are described below.

Direct translation with added phrases and details in brackets to refer and provide context to previous conversations:

Original quotation:

"Let say that Demang when he works we will advise, you must do this and you must do that. Because normally they tend to lari daripada (run from) this one."

Literal translation with a simple paraphrasing:

"For example, Tukang Azih, when he works (on the restoration), we will advise on things that he must do because normally they tend to deviate from the original [documentation]."

Minor translation but with added phrases to emphasise and complete what the subject is describing without deviating from the topic:

Original quotation:

"Some tukang they work part time. Contohnya rumah Tele di Muzium Losong, dua beradik tu dia tukang emas and all. Tapi their main work, but they have good skill."

Translation with additional words and paraphrasing:

“Some tukang work part time. For example at the Tele house (a type of house typical of Terengganu) in Museum Losong of Terengganu, the brothers are both goldsmiths as their main profession, but they have good skills (in building Malay houses).”

Other examples from basic English translated into structured sentences using alternative words to describe a similar meaning:

Original quotation 1:

“We can see in the old days, the tukang, all men they don’t have to draw architecture drawing. How high the house, they know. Kalau rumah tu tinggi ni, mcm mana size rumah tu. At the end it become that shape. So they are so smart in that skill tu, gifted. Same like boat builders.”

Translation of quotation 1:

“We can find in the old days, the tukang and most men did not have to draw architectural drawings. They will immediately identify the height of the house. If a house is to be built at a certain height, the scale of the house [could be easily predicted]. In the end it become that shape (or form). Therefore, they are smart in a particular skill and even gifted, similar to boat-builders.”

Original quotation 2 (Mostly in Malay language):

“Belajar dari rumah lama. Ingat berdasarkan lagu ini, lagu itu. Size ini, panjang pendek, daripada alang muda jarak berapa, lebih pun tak boleh, panjang pun tak boleh.”

Translation of quotation 2 (Major translation from Malay):

“Learnt from old houses, memorised based on bits and pieces (from the process) such as its sizes, length. For example the distances between series of alang muda cannot exceed beyond its limit and also in its length.”

3.4 Conclusion

The description of Malay craftsmanship, skills and knowledge production is an important facet to the success of the study. Hence the study employs various methodologies and involves many individuals, in particular the *tukang*. The study observes the workmanship of Malay *tukang* in order to understand their habits, creativity, knowledge and skills in the Malay house-building culture, which could potentially provide anecdotal evidence to understand a cultural heritage on the verge of extinction. This is achieved by conducting fieldwork in Malaysia, with interviews and observations as the primary method of inquiry.

In the subsequent chapter on fieldwork outcomes, the study attempts to summarise the findings based on relevant subtopics that can explain aspects of the Malay building culture currently practiced by the *tukang* themselves. This will provide a good overview of the development of the building culture from the past until present. The chapter will include the practicality of the building process, issues arising and even similarities or contradictory matters within a description of a culture that is normally dominated by the perception of the researchers, observers and the Malay community. An illustration of this is in the aspect of rituals that may prove useful and important to some, but may be seen as merely obstructive in contemporary practice. In brief, the methodology described in this chapter will assist the assessment of the significance of data collected and presented in Chapter Four.

Chapter Four.

Stories of Malay *Tukang*: Fieldwork Findings

4.0 Introduction

Chapter four documents and illustrates the fundamental issues and questions of Malay craftsmanship to the idea of skills, knowledge and their continuation within the practice of traditional Malay house-building such as in the apprenticeship-style of learning. In addition, the definition and roles of Malay *tukang* are further explained based on interviews and observations conducted during fieldwork in Malaysia, particularly in Terengganu. Narrative and experience of living people associated with the topic gives insight to the intangible aspects of culture that are not well represented in the literature. These empirical data are arranged thematically and cross-examined with the literatures available (from chapter Two) in order to bring light to the subject of Malay house-building culture, particularly in regards to the subject of *tukang*, the building participants and the building process.

This chapters attempts to explain the definition and role of *tukang* and their house-building culture based on various but related Malay crafts such as carving and boat-making. This is due to the fact that most if not all Malay crafts were based on similar concepts within the Malay culture. One example of this phenomenon is *Ayahanda* Latiff Long, who is a carver but has the ability to narrate the building culture admirably although not a house builder himself¹⁹⁴.

4.1 Malay *Tukang*

Chapter two had defined craftsmanship from a general western terminology, which described it as a combination of knowledge and dexterity (Frayling, 2011) with attention to detail and unconscious state of mind (Lawson, 2006), that eventually guides the physical bodily skills

¹⁹⁴ Dr Fawaz recalls his encounter with the master carver, *Ayahanda* Latiff Long, “whom speak about *tanggam* (connections), construction, why this ‘space’ [and] why this exists,” in a very philosophical and fluent manner, better than others (house *tukang*).

(Sennett, 2009). This definition is general and may define the aspect of craftsmanship associated with physical and thinking skills of people who, according to Sennett (2009), '[possess] the quality of work' and 'habit of problem solving'.

While these definitions provide a framework for what a Malay *tukang* could be, the idea of a person who possesses indigenous knowledge and skills in the traditional Malay building culture passed down from past generations, should also be addressed with careful scrutiny. This is to avoid a generalization of a culture that is distinctive, both spiritually and culturally. The aspect of Malay craftsmanship and its spiritual inclinations described in the literature suggests that the realm of myths, values and symbolism are valid within the Malay world and that this should be part of the many elements that are emphasized and celebrated. Hence, acknowledging the people who still practice and are involved within this culture is pivotal in this study as listed in Figure 2.9.

Similar to the common hierarchy of labour between a master craftsman and his apprentices described by Sennett (*Richard Sennett on Art and Craft*, 2013), the Malay *tukang* abides by this hierarchy, as confirmed by Alex of *Terrapuri*: "It is the same (referencing western terminology) [of comprising] a *ketua tukang* (master) [and an] assistant or helper that is a bit skillful (journey *tukang* or apprentices)." His use of the term *ketua*, which means 'leader' - sometimes expressed as *kepala* (head) - suggests that the phrase *kepala tukang* describes the highest stature within Malay house-building culture. It was agreed by many: Haji Yusof, *Tukang Jamal* and Nishak, while Fauzi from *Geng Pecah Rumah* (Housebreaking Group) describes *kepala tukang* similar to 'site supervisors' in contemporary practice¹⁹⁵.

The term *tukang kayu* (wood craftsmen) was also acceptable and frequently adopted by Dr. Muhammad and Alex to denote the specialization of a particular craftsman in woodworking and specifically in building wooden houses. In addition, *Tukang Jamal* clarifies the term *tukang* literally as a Malay craftsman but more importantly to designate his ability; hence the term *pandai kayu* translated as 'clever in wood'¹⁹⁶ could be explained as a person who is skilled in woodworking.



Figure 4.1 *Tukang Ahmad* (left) is measuring the building components while his son, acting as an apprentices, observes and assists him. Source: Author, 2014

¹⁹⁵ Fauzi explained the purpose of *kepala tukang*: "It is not because other *tukang* could not understand (or work), but to seek consent, [akin to] a fixed authority."

¹⁹⁶ Refer section 1.1 (iii).

Nevertheless in this study, the term *tukang* is commonly used to refer to one skilled in building the Malay traditional house, regardless of any additional skills they may possess. Moreover, *tukang* embodies the quality of a master craftsman as one who is knowledgeable and capable of managing the works as well as the people under their responsibility in building traditional Malay structures. This is a fundamental aspect of the *tukang* and the foundation of knowledge and skill transfer within this particular building culture.

4.1.1 Definitions and Roles

In order to seek the definition of Malay craftsmanship from fieldwork subjects, it is important to reference the role of past Malay *tukang*, associated by Abdul Razak (1999) with four important and related attributes: a *tukang* (craftsman), a *pawang* (shaman), *ketua adat* (Imam, religious or cultural leader) and a carver¹⁹⁷. These attributes make his mastery of the traditional Malay architecture whole, as it comprises the principal figures and responsibilities involved within the process of Malay house-building. In particular, the study seeks to define the person worthy of being called a Master *tukang*.

4.1.1.1 Master *tukang*

Dr. Muhammad recalls a case of a Malay traditional *tukang* in *Negeri Sembilan*¹⁹⁸ where he was a *tukang*, a shaman and a *ketua adat*. However, Dr. Muhammad emphasized: “The credibility of the leader was seen not from his appearances, (..) [and] not only to lead but to have skills (in craft or making).” He associated this fact with the ability for most of the Malay leaders in the past to forge their own *Keris*¹⁹⁹. He gave an example of the well-known figure *Dato’ Di Raja Seri Menanti*²⁰⁰: though a prominent leader, was a *tukang* and a person who “manages (house) movings,” and was assisted by a *pawang* (shaman) who not only

¹⁹⁷ For more information refer section 2.2.1.

¹⁹⁸ A southern state in the Malaysian Peninsula that is highly influenced by the Javanese architecture and culture.

¹⁹⁹ *Keris* is a Malay armament that is considered a sacred item in the Malay world as well as a weapon to defend themselves.

²⁰⁰ A famous *tukang* who built the well-known *Istana Seri Menanti* that is still standing today.

knows how to heal and medicate people but physically supports the *tukang* (*Dato' Di Raja Seri Menanti*) in building Malay structures in the state of *Negeri Sembilan*.

Dr. Muhammad explained further: “*Dukun* (another term for *pawang* or shaman) was partly involved in the ritual (..) to determine the location and orientation of the house and whether the *rasi*²⁰¹ is achieved,” hence the amalgamation in status and roles is common due to their shared responsibility. Alex relates this notion to the fact that traditionally, “*tukang* sometimes work as a shaman, who will acquire *depa*²⁰² measurements from the mother of the house,” a ritual to obtain the house proportions. In another instance, Dr Fawaz describes the ability of *Ayahanda* Latiff Long²⁰³, in his knowledge of Malay houses and carvings as well as his proficiency in, “Spontaneously singing songs (..) related to *Wayang Kulit*²⁰⁴ (shadow puppet theatre).” Therefore, it is practical for a *tukang* to become someone who knows the Malay arts and culture, understands its rituals due to his relationship with clients and ‘spirits’²⁰⁵ as well as his technical ability in translating the spiritual ‘measurements’²⁰⁶ into built form.

It can be speculated that traditionally, a *tukang* mastered the art of building and other aspects of cultural tradition to attract wealthy clients and to impress the ruler as mentioned by Alex: “Renowned *tukang* or good *tukang*, they become the King’s or Palace’s *tukang*,” hence it is apparent that *tukang* is considered, “Most important and [possibly an]

²⁰¹ Compatibility of the occupant with the land, house, form etc., this is achieved by conducting several rituals throughout the building culture. Refer section 2.2.2.

²⁰² A traditional measurement system measures from the tip of the right finger to the left finger when both hands are stretched out straight. See section 2.3.2.

²⁰³ Abdul Latiff bin Long is a master carver from Kota Bahru, Kelantan. He previously acted as the advisory panel in the Lembaga Kraftangan Malaysia (Malaysia Handicraft Board) in 1974 and an advisor to the Persatuan Akitek Malaysia (Malaysian Institute of Architects).

²⁰⁴ *Wayang kulit* is a unique form of theatrical performance in Malaysia and Indonesia, using puppets, employing light and shadows, human dancers, verbal story-telling and musical instruments.

²⁰⁵ Dr Fawaz adds to the capability or responsibility of *pawang*, where in wood carvings, it is not only to please the spirit (described in section 2.2.1) but to transfer the spirit out of the wood temporarily while the wood is worked on. Later the spirit will be returned back into the wood after completion.

²⁰⁶ It is also described as magic measurements. Refer section 2.3.3.

aristocrat.” Consequently, “In the eyes of communities, they are one level up (in social hierarchy),” explained Alex.

In contrast, current Malay *tukang* such as *Tukang Ahmad* and *Tukang Jamal* do not share the opinion of Alex that past *tukang* had high social status; though respected or popular, *Tukang Ahmad* describes them as ‘ordinary’. He explained: “Usually their own houses are unfinished²⁰⁷,” suggesting their financial limitations and lack of status symbols. The difference in opinion is probably due to the impression of a high stature *tukang* known and narrated by people such as Alex or scholars, where these *tukang* build reputable Malay structures for Royal families. These are usually documented in Malay literatures or scriptures rather than the normal *tukang* who build mundane domestic structures.

Meanwhile, a *tukang* who builds only for the *kampung* folks were mostly known and respected within their own locality, with exceptions to few²⁰⁸. Their local reputation is described by *Tukang Jamal*: “*Tukang* were not rich but well fed by rice (food) offerings (...) though [they are] well-known (only within their community).” These *tukang* according to Alex are normally, “A good *tukang* [who] builds houses without payment in return. They just build because of the *gotong-royong* (mutual assistance)²⁰⁹,” or social responsibility. Moreover he adds, “The owner will give him food to eat,” which is understandable within a barter system of older generations. This also expresses the importance of traditional Malay structures not only as part of a cultural value but also as a “Main source of income for *tukang*,” claimed Alex.

In contemporary terms, “*Tukang* is our main architect, (...) [Also as] architect, builder, spiritual leader, shaman [of which] some are good carvers. Not like current [practice], segregated.” Alex’s description

²⁰⁷ This assumption of *tukang*’s incomplete house for its constant construction undertaking continues up to this day for Malay contractors (present day equivalent of *tukang*, due to similarities of his roles in building houses). It may resonate with other contractors worldwide, but the assumptions here is still strong among the communities in Malaysia and it can be justified based on the author’s own experience with Malay contractors.

²⁰⁸ Dr Syed claimed that there were traces, “where *tukang* moves around,” subsequently giving examples: “Jamaliah house in Langkawi, the *tukang* is from Kelantan,” hundred of kilometres away and separated by two states and the straits of Malacca. See (Ariffin, 2001, p.51)

²⁰⁹ Refer section 2.1.3 and (Raduwana et al., 2012).

attempts to contextualize the role of a traditional *tukang* within contemporary building culture by highlighting the notion of multiple attributes introduced by Abdul Rahman (1999) to rely on individuals. Nevertheless, perhaps most *tukang* absorb everything they were taught and practiced in the past and after all, they were, “Educated from generations to generations,” Alex adds. Therefore this questions the aspect and scope of practice in regard to knowledge and skills transfers in the Malay building culture.

The attributes of Malay *tukang* are abundant due to the various trades and positions held by them. Alex recalls: “Some *tukang*, they work part time, for example the brothers who built the Tele house in Terengganu State Museum²¹⁰, were both goldsmiths as their main profession, but they are good and skillful in building Malay houses.” However, this attribute of having the talent for meticulous craft such as making gold articles, which is isolated from the building culture, is unstated in the traits listed by Abdul Rahman (1999). This suggests that the list of attributes mentioned is not exhaustive but provides the fundamental qualities that are dominantly evident in previous *tukang*, resembling different characters involved during the building of traditional Malay houses. However, it is always important to keep in mind that according to Haji Yusof: “Old (Malay) people, will not do something wasteful,” therefore lays a purpose in each action of *tukang* within the legacy of the traditional built environment.

4.1.1.2 Craftspeople of Terengganu

Terengganu as described in Chapter Three was famous for its crafts, particularly in boat-making. According to Alex, Terengganu demonstrates significant Thai influence, leading to speculations about its relationship with the culturally rich Kingdom of *Langkasuka*²¹¹. Similarly, Dr. Muhammad described the people of Terengganu as great builders

²¹⁰ The Tele house, a common style of Terengganu house, was relocated and conserved within the compound of the Terengganu State Museum.

²¹¹ The Kedah Annals (written in Jawi: an Arabic alphabet for Malay language) was a scripture written in the late 18th or early 19th century describing Langkasuka as an ancient Hindu-Buddhist Malay kingdom. It is referred to as Lang-ya-hsiu in a written Chinese history. This kingdom was thought to be located in the Malay Peninsula from the early 2nd century AD, however was considered only a Malay legend, by some.

known for their boat or house-building, and metal work. Haji Yusof explained the fact that Terengganu was once the centre of “Maritime, craft and Islamic development” within the Malay Archipelago, a belief with which Alex concurred: “The good *tukang* in Terengganu were mostly boat-builders, therefore they are a perfect *tukang*.” Alex continues; “If *tukang* know how to build houses only, they are average, but if they [knew how to] build boats, they are perfect (skillful).” The reason was that, “Boat-building has to be meticulous, every measurement, it has to be considered waterproofed,”²¹² and therefore Alex justifies that these boat *tukang* have ‘additional skills’ that do not apply within the house-building technique.

Moreover, the term used to describe ‘architecture’ in Malay is mentioned as ‘*seni bina*’, which is translated as ‘art of making’. “Malay boat-building and Malay *gerbang*²¹³ were also *seni bina*,” explained Nishak, indicating the interrelations of crafts that are related to woodworking of large objects. Hence the saying agreed by many is relevant: “A boat *tukang* can build houses, but a house *tukang* may or may not build boats”.²¹⁴

The talents of *tukang* from Terengganu are demonstrated in their basic regional style Malay houses, known as *rumah Tele* (*Tele* house). The history of the *Tele* house was, “Traced back to more than 150 years old,” based on Dr Muhammad’s conservation project at the Malay Heritage Museum site²¹⁵. He compared this to his involvement with other conserved houses such as from *Negeri Sembilan* and *Pahang*, stating that a *Tele* house, “Requires less changes,” or physical interventions in rebuilding it.

²¹² Terengganu *tukang* or boat-builders use a method to heat and mend the timber to make its shape. As observed, Terengganu boat-building is distinct as the surface of the boat is constructed first, before installing its structural skeletal, contrary to how boats or ships are built throughout the world.

²¹³ *Gerbang* (arch gate) is a Malay archway, which was considered part of Malay traditional architecture, built as barricades normally for the entrances of Palaces and houses of noblemen or aristocrats with large compounds. It sometimes becomes the pride and main features of the house exteriors.

²¹⁴ This was mentioned by most during the fieldwork: Alex, Haji Yusof, *Tukang Azih*, *Tukang Jamal* and Dr. Syed.

²¹⁵ This site consists of traditional Malay buildings relocated and conserved from different states as part of the heritage preservation of Malay architectural heritage and artefacts.

Terengganu in the past was part of a bigger civilization, according to Alex, includes Narathiwat, Pattani and Kelantan which, “Is the place we have good artisans [and] skilled workers.” Alex, a Terengganu-born expressed: “In those days, we don’t have borders,” and therefore the flow of artisans and creativity could flourish, hence influencing each other. Terengganu and Kelantan are now within Malaysia and when observed has similar cultural inclinations and language dialect that is unique but has its roots linked to the Thai people²¹⁶. Alex claimed: “Kelantan has good carvers,” but Terengganu people, “Are more creative and artistic.” In craft, Alex claimed that Kelantan is, “More into art forms [and] intangible art,” while Terengganu is, “More into wood-related trades [such as] boat-builder, house-builder and carvings.”

Therefore, it is fair to assume that *tukang* in Terengganu have an advantage where the availability of craftspeople are in abundance and highly specialized such as in the ‘*batik*, wood carvings, *songket* weaver, *mengkuang* and metal works’ to the contribution towards the technique and process of building Malay houses. The author’s opinion coincides with the claim through one of the visits to a group of houses that were first conserved and rebuilt in Terengganu and then later relocated in Selangor, about 300km away. Interestingly, though the restoration activities were years apart, *Tukang* Jamal and *Tukang* Ahmad conducted both of these conservation activities. These houses, which were claimed to be previously part of a palace compound²¹⁷, had special detailing that was made from copper plates. Instead of using timber connectors in the window frames, copper pins were inserted and thus became a distinguishing characteristic of the house, distinguishing it from other traditional structures of the same category. Furthermore, in the author’s judgment, the house signifies the careful work of different *tukang* in the art of making. Besides, these houses were in response to the context of a place and technology pertinent to its location and status.

²¹⁶ According to Dr Fawaz, the late master *tukang*, Nik Rashidin, frequently travelled in Pattani to meet other craftsmen to learn or be inspired. *Tukang* Ahmad also described his experience travelling in Thailand to observe and learn from traditional buildings in his early involvement with heritage conservation projects in Terengganu. Therefore it suggests that artefacts from countries within the Malay Archipelago could be of great resources and information for Malay *tukang*.

²¹⁷ Terengganu palaces were said to consist of small dwelling structures interlinked with raised walkways within a large gated compound.

4.2 Present-day Disassembly and Assembly

In this section, questions and issues within the concept and process of *buka-pasang* or disassembly and assembly were inquired from the viewpoint of the subjects studied. This section opened with the definition of Malay houses, significantly based on their comprehension, considering the amount of physical time they had spent with traditional artefacts. Their experiences were also probed to recall the aspect of knowledge and skills gained throughout the process, whether there were points we could learn from and issues to overcome. Moreover, the author also examined whether disassembly and assembly had played a role at all in the process that took place before, during and after the building process occurs. To note, the disassembly and assembly in the past occurs only at a certain condition as some features of the Malay house could even withstand flood conditions²¹⁸.

4.2.1 Elements of a Malay house

The findings suggest a similar conception of Malay house character from literature and fieldwork, however this varies in the understanding of practice and historical narratives. According to Haji Yusof, the Malay house was based on years of, “trial and error,” in its techniques, materials and concept, mainly influenced by culture and environment. Malay houses may be seen to be a form of ‘art’ but well known in its spiritual inclination relating to *semangat*. “When you started with something with a figure (embodiment of something),” it is considered alive, hence it could be said to have a ‘life’ of its own²¹⁹.

²¹⁸ “If the relocation (of a house) is near, [it could be] lifted. (..) If it is far, disassembly and assembly [is adopted],” explained Dr. Syed. He further recalled stories that in flood areas, “houses were anchored, using ropes, tied to the coconut trees, as if it was a boat.” Likewise, Haji Yusof recalled that during floods, parts of walls are taken off to allow the current of water to pass through the house without damaging the entire structures.

²¹⁹ The ‘living’ associated with Malay houses derived from the measurement of the ‘mother of the house’, proportions were then compared to ‘magic measurements’ that refers to certain mythical creatures (Refer section 2.3.3, point 51) and house forms were said to portray the human body (segment of a head, body and feet). In the same way, the natural wood is considered to embody a force, ghosts or spirit, perhaps simply labelled as *semangat*.



Figure 4.2 Similar to the story told by Dr. Syed, tukang use rope anchored from one house to the other in order to straighten the structure and insert wedges. Source: Author, 2015

Although the Malay house is a ‘non-renewable cultural asset’, it was expanded and evolved throughout the years such as in a concept of a seed²²⁰. Therefore, this building culture has the ability to accommodate for its development in space and time as Haji Yusof explained: “(Malay) houses have already provided for the next generations,” as its ‘modular’ system is, “embedded within its construction DNA,” explained Dr. Muhammad. In some houses, “the beams were extended two feet,” and some, “provide an [additional] door at the rear,”²²¹ deliberately meant, “for future extensions [which] is yet to be built,” he adds. What was more fascinating is that the ‘DNA’ has a definite mention of time, not in

²²⁰ In the example of *Kota Lama Duyung*, parts of the original houses that were found scattered and evolved with newer materials is referred to, “similarly as seeds: when thrown [or planted], new trees emerged.”

²²¹ This extension of beam and additional rear door is evident on the Terengganu house conserved at the Malay Museum in UPM as pointed out by Dr. Muhammad.

literary records, but is evident in its rituals of placing silver or gold coins²²².

The practice of hiding objects such as this was typically acknowledged as spiritual (for prosperity), however Dr. Muhammad believed that it was also part of the concept of, “Malay people’s time capsule.” He argues: “In the past, there was no sales and purchase (S&P) agreement,” hence the coins are citing its year of construction (or an individual status) while communicating the concept of a timeframe. This is however slightly straightforward than to obtain information on traditional timber houses in Austria where scientist has to measure the tree rings of the timber used in order to estimate when it was built.²²³ Dr. Muhammad continues: “Because they (Malays) knew that it (Malay houses) was meant to be disassembled and assembled [in the future],” therefore modular construction relating to house renovation and increase in space is apt for the coins to be uncovered later in years.

With flexibility in modular configurations and techniques, the Malay house even survived multiple amalgamations in form and cultural influences as, “it can use (be connected with) the same or different architecture. Malay houses have *potong Belanda* (Dutch influence), *berpeleh*, *bujang*, *limas* (British influence) within one (architectural) language. Something that is unique.” More importantly, these flexible characteristics of a Malay house as Haji Yusof describes, “Represents the whole life of Malays,” suggesting that the house is both a reflection of the Malay (particularly the occupants) or that it is interdependent with each other (man and artefacts), within a constant and dynamic environment.

The modularity of the house may indicate that the scale of Malay houses is kept as proportionately small in size²²⁴. The idea is in a form of

²²² For details refer section 2.3.3.

²²³ A study was conducted on log houses in Austria using dendrochology, a dating method using annual tree rings to understand not only its year to year growing condition, but the author suggests that it provides a glimpse into the historical aspects – working methods, social and economical background of builders and/or the farmers, history of forest cultivation and wood utilisation, tree felling date and the harvesting season (Klein and Grabner, 2015).

²²⁴ Illustrating the size of a Terengganu palace conserved and displayed in the compound of the National Museum of Malaysia, Nishak explained: “Is this the size of a palace? [Undoubtedly] a bit small. (...) A Terengganu palace for example,

multiplications of a small yet flexible system that allows for a greater purpose even fit for large organization such as a palace or the city. In regards to a typical Terengganu house, “it is following the human scale, therefore the Terengganu house is slightly smaller built, in its height and width,” described *Tukang* Jamal. The module of the house is the basic *rumah ibu* (main house), “multiplied as another unit,” which is then attached to the side of the original house or separated by a *selang* or a ‘corridor’-like platform. “Sometimes, [expansions can take up to] twelve (units),” in one family house, reported by *Tukang* Jamal. This portrays the importance of the kinsfolk, as he explained: “Family concept exists (in Malay houses), therefore unity and harmony prevails within the family structure.” Hence it is vital that contemporary *tukang* understands the Malay concept of family in regards to evolution within the built environment.

An obvious feature of the Terengganu house lies in its distinct embellishments of *pemeleh*²²⁵. Nishak explained: “Two or three *pemeleh* of Terengganu house is a symbol of status,” of its owner while *tebar layar*²²⁶ is for a Perak house. Meanwhile, *Tukang* Azih constructed his house, a pastiche between the old *kampung* styles with traditional features of having three *pemeleh*, which in the past symbolizes wealth and power that were normally associated with royalty. Thus it questions the relevance of such symbolic meanings behind all the ornamentations in this present day.

actually consists of a lot of buildings (dwellings within). In the Complex of Zainal Abidin Palace (in Terengganu), they call it the palace within a city. [These buildings] connected with platforms, linking between buildings, [where] the main palace has a *balai* (lounge structure). Therefore the [so-called Terengganu] palace in the National Museum is part of the *balai*. Not the whole palace, but one of the buildings within the complex (of the city).”

²²⁵ A building component on each side of a Malay house running parallel with the sloping of the roof, similar to a fascia board. There was no mention of the word *pemeleh* in the Malay Dictionary, presumably a dialect word used by *tukang* in Terengganu.

²²⁶ “*Tebar layar* is a symbol of the Perak house. [For example], the *tebar layar* of the Perak house located at the Malay Museum has three levels, because the owner was a Royal person,” replied Nishak.



Figure 4.3 *Pemeleh* is a building component running parallel with the sloping of the roof. *Tukang* uses images of their previous projects as reference or presentation to clients and their apprentices. Source: Author, 2015.

Nevertheless, the variations of houses such as having two or three *pemeleh* - apart from the lack of guild-like organisation²²⁷ - go back to the traits of the *tukang* himself. *Tukang* follows the practices that were widely accepted based on the client's requirement and *tukang's* interpretation of the client. This is evident in one of the traditional houses the author visited, that were previously conserved by *Tukang* Jamal and currently relocated with new modifications in its organisation²²⁸. The houses were claimed to be of Royalty owned as was evident in the peculiar detailing made of brass. More importantly it has thinner structural columns and distinct numbers of columns, four rather than six, which were based on *tukang's* mutual agreement from client requests²²⁹.

²²⁷ The lack of guilds results in, "Malay culture to not do things precisely, non-homogenous, contains variations and [adopting] estimation," explained Dr. Syed. Accordingly, the Malay use economical and utilitarian principles as a basis, "perfected through time," he adds.

²²⁸ The houses were previously relocated and conserved at a private compound in Terengganu owned by a person in the name of Sadaq. Later, while on a second fieldwork, these houses were bought by a new owner, which were then relocated and conserved in the state of Selangor. Interestingly, the new conservation consists of rearrangement of the houses, side by side in parallel to their length, hence additional structures and platforms were introduced in between as per the client's requests.

²²⁹ Though the structural columns looked fragile, *Tukang* Jamal explained: "Those (structures) are strong, the thin columns, don't they look beautiful? It doesn't have to be big. The location (of columns), its sittings (location) are just

Hence past *tukang*, with their wisdom, often accommodate any requests from clients while at the same time conducts according to their skills and the norm of community. However, it was a common practice of Malay houses within a similar vicinity to exercise the same characteristic²³⁰, to have building parts or sections taken from a single house²³¹, or sometimes differ in techniques from one place to the other - especially between states - but also different due to context. This gave a new understanding to the way traditional Malay houses adapt not only to their users but also towards locality and environment²³²."

Conversely, understanding the disassembly and assembly (*buka-pasang*) is to acknowledge the cultural affect it has towards the Malay. "One (main) factor in this, is *rasi*²³³," where Nishak reported that the Negeri Sembilan house at the Malay Museum, "had two to three times [been disassembled and assembled], where the period between each

right." Tukang Jamal not only endorsed its structural capability but also the aesthetics associated with its functions although the author considered the structures as too thin. Nonetheless, according to Tukang Jamal, the original *tukang* who built it, "Does not follow the norm, [which] seldom occurs, [but] the owner is from *Kampung Rusa*: a very wealthy man, a merchant. He wants to do more than anyone else (...) [As a result] wanted to create something unique."

²³⁰ Dr. Fawaz reported of a comparative study of Tukang Kahar's (a very respected master *tukang* who built the Istana Sri Menanti in the state of Negeri Sembilan) personal house that has, "similar physical evidence," in nearby houses; however have yet to be proven due to a similar *tukang* in his era existing.

²³¹ In the *Kota Duyung* conservation project in Kuala Terengganu, circa mid-1995, Dr. Syed reported of instances where they, "found parts of the buildings elsewhere," therefore they had to, "measure (...) [produce] drawings, and assembled back again (with new components)." For further reading on the project refer; Syed Ariffin, S.A.I., 2003. The Malaysian Experience The Conservation of Kota Duyung. Presented at the 2nd IFSAH 2003 & International Symposium on Asian Heritage, Faculty of Built Environment : UNIVERSITI TEKNOLOGI MALAYSIA, pp. 1-12.

²³² For example, it was mentioned by Nishak of the Pahang where the practice of using tenon joints for the columns to rest on the stone stumps, "is unheard or lack of, [even] within literatures, (...) as normally columns were deliberately placed either on hard wood posts, stone or even upside-down clay flower pots." She adds that large clay flowerpots are commonly used as house stumps in Penang - It is sturdy as the multiple columns of the Malay house are distributed evenly on each pot.

²³³ The concept of *rasi* is described in section 1.1.(iv). For further reading see (Arrifin, 2001).

disassembly and assembly is short, one in the 70s and the last was in 2013.”

4.2.2 Techniques in Building



Figure 4.4 *Tukang Ahmad (right) with his apprentices measuring and assembling one of the fabricated wakaf structures at his workshop. These structures will be disassembled again and transported to site. Source: Author, 2013*

Throughout the process of erecting columns, there seems to be a fusion in the practice between building technicality and conducting certain rituals. It may also derive from the necessity due to the outcome of the prefabrication system. For example as mentioned by Alex: “All the columns have layered pieces of cloth,” called *kain lapik*²³⁴ also, “known as *Bunga Halang* (Block Flower) (..) [or] *Bendera Pendekar* (Warrior flags).” Alex adds that these cloths functions to, “protect the house from

²³⁴ This ritual of installing layered coloured cloths on top of columns as according to Alex is a custom “heavily [influenced by] Hinduism. [The cloth] in Terengganu is [placed in the order of] white on top, red then black [to represent accordingly as] purity, courage and mysterious spirit.”

spirits to enter,” but as a pragmatic view, was known to, “work as part of the carpentry reasons, acting as a gasket,” in preventing noise from the shearing of structures in *tanggam* connections. Alex also considered it to act as a lightning conductor in the past, and therefore “had to keep explaining to them (*tukang*),” these ‘hidden’ motives.

Meanwhile, the achievement in the disassembly and assembly procedural technique of the Malay house was summarized by Tukang Ahmad: “Everything (building components) are fabricated, (we) made markings and disassemble, [finally] transferred to site.” Haji Yusof praised this ‘modular’ technique in Malay building culture when he described its advantage: “(Malay) houses are capable of additions (structural and spatial) in multiple angles. Additions and increments are conditional; doubled (in size) or additional space (as in functions).” This modularity concept is facilitated by the techniques in jointing described as *tanggam* - or based on Nishak: “Using *pasak* (wooden dowels)²³⁵, [which] functioned as a key,” that is flexible, however it requires constant human intervention²³⁶.

Similar to the description of Hilton (1992), Alex explained further: “Every year, after the monsoon, the house becomes a bit *riang* (loose), so we have to use timber wedges (for tightening), [therefore from] time to time you have to check everything (jointing and its element) within a house.” Alex persisted that, “this is because it (Malay house) is prefabricated.” The account of actions required in order for the house to function well - or probably be considered as building maintenance - promotes an active and direct interaction of the occupants (human) with the artefact (house) itself constantly. Most notably, is the understanding that the disassembly and assembly also includes the similar gestures and actions to make sure the building components are in place and reinforced.

Currently in Malaysia, prefabricated building systems are normally thought to be temporary and thus fragile, however the Malay house is considered both. Tukang Azih claimed: “When there are storms, the roofs of traditional houses were never ripped apart as compared to new

²³⁵ *Pasak* or known as wooden dowels are a wooden ‘pin’ used to hold timber building parts together.

²³⁶ This simply referred to the use of *baji* (wooden wedged) as a flexible element to increase firmness in the *tanggam* system. Refer section 2.1.1.

buildings.” It is known that the roof of a Malay house is bound together within the whole building system using a stronger type of wood, thus increasing the robustness especially in the connections. Tukang Azih further explained: “Dragon wood (*kayu naga*) is much stronger, to built *pasak* (connections).” This may explain why the Malay house and the *tanggam* connection are still intact and capable of withstanding rough handling throughout the years.

The traditional building system also has its limitations. Alex mentioned these limitations in regards to the size of the house: “Width or opening of the house cannot be too wide, due to the [nature] of the roof. Let’s say 10 or 12 feet [and] its length 22 feet roughly.” “For example, a *bujang* house, if you’re making a *selasar* (floor beam), it’s about 8 feet only (length) as you cannot do 10 feet,” he adds. Then again, the limitation did not refrain the building to be multiplied, which is evident in the Malay house styles of Terengganu. Alex further highlights this circumstance: “But when the family extended, they built a new house next to it, a detached extension,” thus this verifies the reason for such a building system. “Therefore that is why they (past *tukang*) built prefab: you can take it down and put it back,” which is similar to modular buildings we find today.

4.2.3 Conservation strategy

The Malay building culture in the past consists of a holistic building procedure from acquiring raw materials to manually shaping using hand tools in making building components and assembling the structures as one unit. This was normally considered as voluntary endeavour, which conflicts the capitalist approach to paid work at present. Nonetheless the traditional model could be replicated²³⁷. Whereas currently,

²³⁷ During the fieldwork, Tukang Jamal mentioned a small *surau* (small prayer building) project in an isolated place, with facilities that are unavailable or lacking. This project, which he and other volunteers were involved with, adopted the Malay house concept of timber framed modular construction system. It is at a site where the only access was via a muddy route for lorries involved in foresting activities. Therefore, the project insists that the source of building materials has to be sought from existing and nearby forest and using only limited hand tools. With twenty to thirty manpower on a project basis, everyone came with their own resources to assist the building process that mimics a traditional building practice. This demonstrates the extent of past

traditional Malay houses are rarely built and existing structures require conservation or reconstruction, thus potentially demanding a new perspective into the conservation process. Despite this, the, “conservation [concept] may have been embedded within the [Malay] culture²³⁸, but was regarded as something else; not ‘conservation’ in the modern sense, but with a similar purpose,” claimed Dr. Syed.

“Because we are dealing with traditional buildings, (..) [there ought] to have been hidden forces,” hence a ritual should be included that is not blasphemous, explained Dr. Syed. The reason being: “One reason for [including rituals], everybody in the group [involved, will] realize that it is a religious [or spiritual] affair, not only a construction method.” As experienced, Dr. Syed suggested ‘smaller rituals’ conducted in between the conservation practice in order to attain momentum in the, “mind and soul [of *tukang*]²³⁹.”

According to Dr. Muhammad, a basic house conservation process adopting disassembly and assembly begins first by conducting surveys of artefacts (the house) and its site. This is to ensure the safety and rigidity of the structures (including identifying wood types) for disassembly and assembly later. He then looks at the legal requirements of the house, for any potential setbacks or obstructions²⁴⁰. Thirdly is to dismantle the house and place it into lorries for transport to a new site if necessary, which is common practice for Malay houses. Until now, the constant ‘relocation’ tradition leads to deviations from what was recommended

building concepts and techniques that can be adopted in the worst possible situation and still find relevance in the modern world.

²³⁸ As noted by the author’s experience and was highlighted by Dr. Syed:

“Underneath Malay houses were piles of building components (..) where they (owners) used to repair (the house) individually.”

²³⁹ Dr. Syed claimed that, “the hands acted in accordance to mind and soul; if the soul is corrupted, the mind is corrupted,” hence these ‘smaller rituals’, which currently seen as insignificant, are lacking in practice today.

²⁴⁰ Common problems with land matters in Malaysia, or as in this case regarding the house, is that a land and the house can have more than one name associated to it, hence having multiple owners. Typical within inheritances, the names mentioned must agree to any changes in the transaction relating to it, including whether to sell or relocate the house or offer the whole: site and the house.

by UNESCO or ICOMOS; to conserve as much as possible within its actual site²⁴¹.



Figure 4.5 Tukang Jamal's apprentice using one of the machines to make *tanggam* connections. Source: Author, 2014

In comparison, Fauzi's approach was to conduct conservation that requires least amount of time, effort and damage to the building components as well as *tanggam* connections²⁴². His approach lies in the disassembly and assembly that requires less human energy when performed; when fall short, "[meant that it] did not follow the (effective) strategy." This is prevented by, "looking at the *salam (tanggam)*, which one (method and type) is effortless and safer [to conduct] (...) [Initially] less tiring." In short, Fauzi's strategy was merely practical and devoid of any mention of ritualistic or procedural technique, although he did describe such occurrences²⁴³.

Meanwhile in the workshop of Tukang Jamal, he adopted multiple machines to help in the shaping or cutting of wood. In an age where time is precious as well as money, the author observed that the machines provide a quick and precise initial intervention of materials. This is to achieve their basic form and measurements prior to the use of hand tools such as chisels for minor adjustments during preliminary disassembly and assembly. The aspect of the 'rigidity of machines' and the manual dexterity of the *tukang* is critical and requires that both be within a direct and integrated process from one stage to the other. Therefore, a conservation project on the scale of Losong Haji Su house conserved by Tukang Azih benefits from having a machine and wood cutting equipment on-site as suggested by Tukang Jamal.

In regards to disassembly and assembly, the conservation of the Malay house is currently conducted by involving multiple existing Malay houses

²⁴¹ For on-site conservation, Tukang Jamal suggested machines to be located within the project vicinity if the project is expected to take a year or more, hence it is economical. "It is for better coordination as one can cut while the other makes mortise holes to ease the process," he asserted, as it makes sense within a contemporary conservation process.

²⁴² It is understandable that Fauzi's approach is to maximize the number of timber salvaged, as some can be sold individually at a profit.

²⁴³ Fauzi and his team disassembled a small house built by Tukang Kahar for three days. After looking at possible options - "To smooth out (using jack plane) was not possible, in terms of safety, is not guaranteed," and therefore, "in the end, we decided to cut (beam)." The timber was of teak, but the method of it being assembled puzzled him, which was impossible hence giving a witty remark: "[Probably] he (*Tukang Kahar*) employs ghosts (to assemble)."

in order to conserve a few. “In *Tanjung Sabtu*²⁴⁴, they bought (houses from everywhere) and assembled on-site,” explained Tukang Ahmad. However, apart from the conservation of Losong Haji Su, others such as *Terrapuri* depended on numerous Malay houses, as explained by Alex: “I assembled about twenty-nine units (in Terrapuri), [from] those houses [that] are below 50% (portion of the house still remaining) which is hundreds of them.” Apart from that, “we see 40% (from houses disassembled) that only have six columns [surviving],” which were used as spare parts for some completed house, because, “we could not restore (them) anymore,” Alex concluded. Hence the *tukang* involved in these conservations were exposed to different variations of existing Malay houses. This is parallel to the recommendation earlier, where the remains of a Malay house should be used only for another conserved house.

Despite this, the author observed that some salvaged building components are useless for conservation due to the required qualities and properties. Tukang Azih explained this issue: “The critical element in the house is the *rasuk* (beam); this is the longest, direct (continuous) member and cannot be divided (split), except for the *bujang* (main) house of Dutch styles.” While it is easy to manipulate reclaimed components from other Malay houses, “[since] it has perforations (mortise holes), it can be repaired or reproduced, and, [if] the beams are damaged, [it is possible to] replaced with new timber. From there, we make new joints (mortise and tenon),” explained Tukang Azih.

Some components demand odd sizes that are not available off the shelf and must be specially ordered²⁴⁵ to prevent problems on-site²⁴⁶. In

²⁴⁴ A conservation project in Terengganu complex consists of a privately owned house, artist studio and gallery. Tukang Ahmad was involved in the development from end of 1992 till 1993, however the complex is now neglected.

²⁴⁵ As described in section 4.3.3.3, timber properties for a traditional Malay house differs from modern requirements. Timber had to be ordered from sawmills, which it is taken from forest reserves. Therefore, this will incur costs and time, where salvaged timbers are an advantage.

²⁴⁶ The author noted during fieldwork when Tukang Azih was constructing a new staircases for Losong Hj Su conservation project. The timbers bought on-site were shorter and thinner than required, hence additional timbers were glued and added to form the desired thickness and length. Tukang Azih lamented that this may affect its structural ability and devoid the authentic methods in Malay house-building, particularly in ways timber could be joined together using *tanggam*.

contemporary conservation, these problems of material sources exist alongside other issues on site. In the case of *Kota Lama Duyung* (Duyung Old Fort) conservation,²⁴⁷ Alex recalls: “At Kota Duyung [only] 30% [of the original building] remains, the balance (structures and form) were rebuilt, almost quite a good project except for the carpentry work, because you give [full authority to] the contractor. So they (contractors) pass and make shortcuts, similar to now (referring to Losong Haji Su conservation).”

In contrast, Alex claimed that his Terrapuri project is a success, as a result of his, “team that conducted research and also the *tukang* (involved).” One notable aspect in Terrapuri is the effort in, “documenting and interviewing hundreds of owners, carpenters carvers and neighbourhoods.” This is, “because we feel that the house is a very important element in those days.” On-site, he claims to have documented and traced every detail of the houses they had engaged with. “Also the *tunjuk langit* (an embellishment on the roof top) [and] even the staircase: some [resembling] *tapak gajah* (elephant footprint), some are *Makara*, we trace (recorded) them all.” Apart from the house itself, the insides were also documented, “we got chairs, table, because later on [the Malay culture was] influenced by the British²⁴⁸.” Alex finally adds: “Initially, [we conserve] the floors that are using *pasak*²⁴⁹, all were restored [and] documented one by one in the traditional way, piece by piece.”

Terrapuri’s strategy was to rebuild some of the components first as Alex explained: “We did a [mock-up] model,” for example he described the need to construct *pelupuh*, a wall component, as reference first. Afterwards Alex asked the *tukang*, “to dismantle it piece by piece,

²⁴⁷ A project completed in September 1999, Kota Lama Duyong, is located in Pulau Duyong, Terengganu, where the architecture has nine roofs covering multiple spaces within it. The design mimics a traditional Malay palace with strong influences from Corinthian and Egyptian styles particularly on its pillars and stone walls. This architecture visualizes a pastiche of different Malay house styles: *Bujang Berpeleh*, *Limas Bungkus* and *Potong Belanda*, with addition of intricate carvings on its verandah.

²⁴⁸ Regarding the styles, it was believed that Malay houses are like Japanese houses, dependent on their loose house fittings ie. size of mats or *dulang* (See: Ariffin,2001), which is believed to be based on a modular system.

²⁴⁹ The use of *pasak* (wooden dowels) in Terengganu house and boat-building are common and well known in the past, therefore could demarcate the techniques of traditional from non-traditional artefact.

document and put it back piece by piece according to the mock-up model.” Alex and his team had acquired their own operating procedure exploiting the disassembly and assembly process, as the technique was the heart of this building culture. Equally important is that the *tukang* can learn and understand the whole aspect of the Malay house themselves as Alex responded to this conservation technique: “Because some *tukang*, they don’t know (efficient procedure or theory), [therefore] they have to ally with us,” which identifies that the practitioner as well as the custodian of knowledge such as *tukang*, should work hand in hand in order for this building culture to sustain and develop.

It is apparent that in all conservation practices of Malay houses, there will be disagreements. Tukang Jamal claimed that in most conservation projects, “houses deviate from their concept, inconsistent with the method of connection for that particular house²⁵⁰.” “If we have skills in craftsmanship, we don’t want to do that (mistake) as it deviates from concept [where] the type of connection is not meant for that particular kind of house.” Despite this, Tukang Jamal asserted: “We can accept (mistakes) it is just inconsistent with the concept (..) but we could not achieve the ‘feel’ (..) as there is ‘something’ else.” He defines whoever deliberately makes these mistakes as, “Initially a passionate person, but now takes for granted (the Malay building culture), as he only wants to build.”

Furthermore, Alex commented on Losong Haji Su conservation project as quoted: “They did the restoration with mistakes [especially on] proportions, but I hope it turns out to be good use, with ‘soul’.” Alex recalls the restoration of *Kota Duyung* and commented: “Nice but failed. No soul. No visitor. Failed in terms of activities and maintenance,” regardless of its celebratory attempt in conserving an important heritage.

Apart from disagreements with the construction method, Dr. Muhammad disagrees on the policy stipulated by ICOMOS in the aspect

²⁵⁰ Tukang Jamal explained: “For example, instead of *kasau* (rafter) they use *kekuda* (truss). We only use three *kekuda* (within a house),” which highlights his experience of other traditional house customs. According to the author’s understanding, *kasau* and *kekuda* has similar function - to support the roof span - but according to Tukang Jamal each has its own place in traditional ways.

of good conservation and preservation practices as described earlier. The standard practice is in situ rather than transferring it to other sites such as what most traditional Malay houses had gone through. Dr. Muhammad argued that it is compatible with other western buildings, “mostly brick monuments,” as they, “could not be relocated and will have to be preserved on-site,” in contrast to timber framed structures such as traditional Malay houses.

Taking examples of the Pahang house currently under conservation, the house is being neglected and there was a threat from natural disaster such as floods²⁵¹. Thus the matter implies the need for an alternative from in-situ conservation practices. Dr. Muhammad also argues that apart from the placement of the house, which was far from the city centre, it is highly impossible for it to be visited by heritage enthusiasts or regularly maintained by the museum, though it wasn't the museum's initial idea to conserve it in the first place. This reminds the author of the *Kota Duyung* conservation building which Alex claims to have failed spiritually as mentioned earlier, possibly due to its secluded location.



Figure 4.6 Pahang house is a ninety year old traditional house, was disassembled from Pahang and re-assembled in The University Putra Malaysia, Selangor, as a conservation exercise coordinated by the Malay Heritage Museum. The reconstruction includes the use of modern day material as part of the roofing element. Source: Author, 2014

²⁵¹ Dr. Muhammad claimed that the house was affected by the, “1916, 1971 and 2014 big flooding.” Due to the location of the house abutting the riverbed, “it is unlikely to survive another series of natural disasters,” as evident where the “surrounding houses were destroyed, leaving this house the only one standing.”

As the Pahang house was chosen based on its historical and significant values, Dr. Muhammad believes that he, “strictly follows the practice of conservation,” for example, “in order to replace the *balai* (entrance hall section), I have to buy another traditional house,” which has similar elements and components as the one being built. Therefore, he claimed that the, “standard of practice is still exercised, apart from in-situ.” More importantly, the aim of the conservation is to reproduce an artefact to its original state, which was justified by Alex of his Terrapuri: “For our restoration project, we must at least restore the same thing, like in the old days. We document, so *tukang* have to do the same thing (as per original). For example, *Tukang Azih*, when he works (on the restoration), we will advise on things that he must do (traditionally) because normally they tend to deviate from the original documentation.”

4.2.4 Skills and Knowledge reproduction

“The old wood, old houses, these are my teachers. I observed while dismantling the old houses, I was inspired and [thought to myself] that I could do it, therefore I only observed these (detailing) (..) and I mimic the old techniques. [I] have no teacher, as old people (tukang) have passed away.” - Tukang Azih, 2015.

The characteristics of the Malay house is described to be implicit in both its physical and ritual aspects, as the *tukang* of the past relies on oral tradition to inform its history and practice. Dr. Syed narrated that the Master *Tukang*, Nik Rashiddin, once said: “Now we haven’t the *guru* - no longer here to teach us anymore, [hence *tukang* should] look for masterpieces, left by the *guru*.” Nik Rashiddin is also reported to acquire masterpieces from elsewhere when he has the opportunity to do so, as a reference. Similarly, according to Dr Fawaz, Nik Rashiddin will build his own masterpieces, in a bigger scale than what was intended in order for others to learn – hence signifies the importance of physical artefacts. It could be apparent that, “good excellent piece of work, capable of transmitting the maker’s [ideas or craftsmanship],” which Dr. Syed

termed as, “new *guru*,” however, “only for [*tukang*] that is humble enough to want to learn”²⁵².

However, an interesting phenomenon in disassembly and assembly building process was mentioned by Nishak; when asked whether if at any point the process has a basis for knowledge transfer, she replied: “Yes, if we don’t do it ourselves (physically involved in the building process), we could not see (understand), as everything is hidden [from plain sight] (in the *tanggam* connections),”. She further asserted: “Malay architecture is undoubtedly hidden, less visible (of unnecessary features).” “If using *pasak*,” she adds, “he (*tukang*) will hide it,” as Nishak gave an example, which is evident in the Terengganu traditional houses. The *dinding berhias* (wall panels) have, “less visible jointings, [that are] hidden (from plain sight)”²⁵³,” that indicates flawless in beauty and craftsmanship.

The Malay houses, when everything is perfectly in place and intact²⁵⁴, can only be seen as a house, an integrated entity. However, when deconstructed into separate components anyone could be overwhelmed, hence the author anticipates the discovery instinct coming into play. The disassembly and assembly provides the framework of discovery into Malay craftsmanship as agreed by Alex, “so that is why, in over 100 houses (disassembled and assembled) we have found so many things,” and more appalling, he claimed that even, “the museums don’ know,” of some of the discoveries that they had encountered. Similarly Nishak described her experience when managing disassembly

²⁵² Dr. Syed emphasizes the character of a learning *tukang* as humble and, “sincere,” in reference to what he described earlier of ‘mind and soul’ (refer note 271). By learning, the *tukang* will, “attempt to copy,” which, “triggers the mind (ideas),” from these masterpieces, which were, “exceptionally made by masters.” One exception, he said, was that it is difficult for unskilled *tukang* to understand.

²⁵³ Hidden details at *dinding berhias* makes it hard for *tukang* to disassemble, hence normally it will be relocated while still intact as a whole wall. Moreover, this represents an intricate craftsmanship, which this building component happened to be the most likely visible and adorned to viewers.

²⁵⁴ The aspect of Malay craftsmanship insists on perfection due to the ephemeral nature of timber and exposed building components that are prone to the harsh tropical weather. Hence, the details are flawless and kept hidden, as according to Fauzi, this is a way for the structures to maintain their strength, therefore making the building last longer as the gaps are not exposed to insects, dust, water seepage and more importantly termites.

and assembly as quoted: “When observing him (*tukang*) disassemble a house, secrets are revealed.”

“When we do restoration we can find different jointing, different cuttings, how he (past tukang) joined the wood, we have all (records and documents). It is [actually] quite easy to understand.” - Alex, 2015.

To elaborate, the discovery of ‘secrets’ from hidden components is obvious as described by Nishak: “Columns are hidden behind walls, hidden components are hard to see, high roof (components) are [also] hard to see. Columns at *serambi* (porch), there is a hidden *tanggam* on the column and beam. It is cut at a diagonal part.” Likewise, it is different when dealing with other type of Malay houses. Nishak gave an example: “If Perak house [type], the roof is not steep (compared to other houses), maybe similar to Malaccan house.” Variation in details also leads to the aspect of different techniques found by contemporary *tukang* and apprentices during the disassembly and assembly. This leads to suggest that though *tukang* could learn, “from artefacts made by others (*tukang*),” as quoted by Tukang Azih, it also question the identity of the original *tukang* himself. “We don’t know who [builds it] and from what generations [the *tukang* comes from],” thus instilling the unknown ‘entity’ that still lingers around the ‘artefact’, pointing towards the concept of *Guru Asal*.

The process of disassembly and assembly conducted by many, inevitably appeals for further investigation into other associated aspects, such as its history. According to Nishak, the Pahang house she managed for conservation at a different location provides a glimpse into its past: “The date for the Pahang house is 1924, affected by flooding in 1971, also affected by (another) flood in 2014.” These dates narrate the events that took place and their affect on the form of the house, hence provoking speculation and presumption of the building character. In contrast, there were also aspects of the house that was to be expected, as in other traditional Malay house. “(We) already expected something to be in the *tiang* (column), and there is, [as in] other houses [such as] Perak and Terengganu houses. In the Pahang house, the shillings (coins found) are inside the mortise and tenon joints. [We] found two silver shillings: one dated 1919 and the other 1910.”

Findings such as the silver coins provide answers to the year the house was originally constructed and the use of a shilling type gives an indication of wealth of the previous house-owner. Nishak postulated: “(We) cannot exactly confirm why 1910. Maybe the previous owner’s house was made in 1910? There is a possibility.” Besides, the different years of the two shillings were unusual, as described by Nishak: “The gap in years is too great, it is not logical if there are no strong reasons.” Subsequently, such probe will also lead to the discovery of other matters within the house itself, potentially revealing the culture or personality of the owner. “If we consider the items (artefacts found inside), the owner was very rich. Objects and utensils were made in England and Japan. This is what remains to be uncovered after flooding,” Nishak concludes.

The Pahang house was appealing and at the same time important to Dr. Muhammad and Nishak due to the unusual use of *puting* (tenon joints) on the base of columns. The use of mortise and tenon joints on the columns were an important find as it gives the context of the house within a flood-prone area. Dr. Muhammad explains that due to floods, “surrounding houses were destroyed, leaving this house the only one standing. [We] found why it (Pahang house) can sustain, not just [the use of] *puting* on top, but also *puting* below. [These *puting* were] shaped [as such], due to flood [conditions].” As explained by Nishak, the use of *puting* is unique and the Pahang house adopted other techniques to accommodate the impact of flooding²⁵⁵, which she argues: “In books (literature) or other houses from other states we could not find this [technique].”

On the other hand, there was also a discovery that leads to speculation about the people involved in building traditional houses. Dr. Muhammad and his conservation team have their own preliminary theory about the puzzling discovery of Chinese inscriptions on some of the building components that prove otherwise²⁵⁶. As a result, this encourages

²⁵⁵ Nishak explained their discovery: “We found the *putting* (tenon joints) when lifting the columns. Roughly it [all] looks the same, but when inspecting the stone stump, it was found elevated one feet higher and submerged 1 foot below the earth.” The *puting*, though considered practical, is, “awkward and never seen in such houses,” but, “when [we] enquire other people from the same *kampung* (village), every house uses the same method (..) [it is] a truly localized technique,” she adds.

²⁵⁶ Initially, according to Dr. Muhammad, he suspected that the house was built by a Chinese *tukang* as he had the impression that, “if the one who assembled

fascinating discovery and predictions that may provide clues to a larger understanding of the people within a trade during that particular time and place. Furthermore, it also suggests that Malay *tukang* did not rely on inscription on components, but rather on their instinctual understanding of the function and location of each component possibly based on sizes, length, thickness and other physical traits²⁵⁷.

After experiencing disassembly and assembly, it is apparent that the *tukang* or apprentices could see or expect a pattern among all the houses they interacted with, hence house design becomes a custom. In the same way, *Tukang Ahmad* clarified this matter: “*Tukang’s* level of craft is mostly the same, (..) [as] when we observed [traditional houses], the length and height (of the house), [looks] like every house [was] commissioned [from] the same *tukang*.” However he adds: “*Rumah Ibu* (main house) or *rumah bujang* adopted twelve or sixteen (pillars), but the shape is similar. Whether it is the same *tukang* or different was already a mystery.” *Tukang Ahmad* suspected his findings: “Possibly its origin is from one *tukang* (likely a master with ideas and knowledge), but dispersed,” and passed down towards other apprentices. Therefore, one may wonder the general schemata in Malay house-building knowledge and skills transfer. Similarly, it seems that it may take common sense to understand or act in accordance with customs or techniques that were widely accepted by the locals.

Correspondingly, having visited Thailand while involving with the reconstruction of *Tanjung Sabtu*²⁷⁶, *Tukang Ahmad* noticed a similar pattern in both Thailand and Terengganu houses²⁵⁸. Although with minor difference in the characteristics or properties of a house, it may not be apparent to others (layman) except for people with experience. Perhaps it is only obvious to those who have had the opportunity to conduct

them (building components) was a Malay, how do they know (understand) Chinese,” and that was because, “sawmills were then dominated by the Malay community.” Later on they figured out that the timber components were sourced from sawmills operated by Chinese workers, hence the Chinese lettering.

²⁵⁷ These characteristics could be considered affordances of the building components that guide the *tukang* instinct. According to the Affordance theory, these objects provide the means for possibilities in actions through the perception of the observer such as *tukang*.

²⁵⁸ “In Thailand houses, the lower end of a column is bigger [while] the higher end is smaller. This also occurred in Terengganu houses but not so obvious. However, now it is straight. This depends on the *tukang*.”

disassembly and assembly themselves. The experience associated with understanding a building technique can also be useful in reading the characteristics of a house. Similarly, *Tukang* Ahmad expressed his opinion towards the Losong Haji Su house conserved by *Tukang* Azih: “Haji Su house had already been modified numerous times. [We] can identify based on the connection (*tanggung*); the type, techniques [and] mortise holes present.”

The evidence in the artefacts also theorizes the methods in which it was made, or why it was made as it was, and what influenced them as portrayed in the *pemeleh*²⁵⁷ component of a Terengganu house. The making of *pemeleh* has different techniques from one *tukang* to the other, hence its curvature varies from one house to the other. Although the length and width of houses are commonly the same and using a typical modular and measurement system, *Tukang* Jamal asserted that it is not possible to duplicate the same *pemeleh* from other houses. However, he explained ways to achieve a perfect *pemeleh* from the visual aspect in order to ‘feel’ (or *rasa*) what he describes as ‘softness’, which may be translated as ‘proportionate’²⁵⁹. In contrast, the word *keras* (hard)²⁶⁰ is used when considered inaccurate or unattractive.

Meanwhile, in contrast, *Tukang* Azih and Haji Yusof claimed that traditional methods were based on the impression towards nature. According to Haji Yusof, the curvature of the *pemeleh* was derived from

²⁵⁹ *Tukang* Jamal’s method of making *pemeleh* is described: “From the perspective of craftsmanship, to identify its ‘softness’ we have to prepare two wooden planks, (...) [take a string] and straighten it (from one point to the other) and take its ‘stomach’ (centre of *pemeleh*) while letting it sag down. The ‘softness’ (of the curvature from the string) depends on the level that we wanted. When we ‘soften’ it, it will curve downwards. Therefore based on the string (curve), we can mark it.” “To make it beautiful,” he adds, “make sure it (the wooden plank used) is wide: 14 to 16 inches. Usually the end is 8 inches,” in which he emphasizes the exact length in modern measurement, apart from the ‘visual’ satisfaction of it. “This is the formula used by past people to achieve (results),” he concludes.

²⁶⁰ When *Tukang* Azih, *Tukang* Jamal and Alex criticised the *pemeleh* (a building component of the Terengganu traditional house) in the design of the modern Terengganu Airport, State Museum building or other houses, they criticised its proportions as *keras* (hard). It is the opposite of *halus* (soft or fine), which is accepted and more appropriate with a *tukang*’s grammar or within Malay craftsmanship.

banana trees²⁶¹ as he commented: “Old people (past community) did not do things accidentally, they are inspired from somewhere (especially nature).” Both origins of *pemeleh* have their strong points: a banana tree is found in abundance in the *kampung*, while strings are commonly used in carpentry as a guideline. In short, Tukang Jamal stressed an important reason for a perfect *pemeleh*, “people will see it as if ‘not crowded’.” The word ‘crowded’ conceivably expresses the aspect of simplicity or proportionality in the whole composition of the house.

With regard to the development of techniques within traditional Malay houses, it is apparent that in seven years of building *Terrapuri*, Alex noticed a rise in *tukang*’s capability. The numerous disassembly and assembly conducted by *tukang* had its affect, as “slowly, the skills increase,” because their awareness towards their craft increases and according to Alex: “They (*tukang*) know what is wrong,” and could recognise the consistencies or inconsistencies within each of the traditional buildings encountered.²⁶²

While this is the case, there is also a discovery in development of other building components such as the fascia boards. According to Alex, “Even the fascia board, before it evolves into the vertical plane, it was [previously] horizontal to follow the roof tiles. After that it is [placed] sideways.” Alex believed the evolution is only relevant to Malay architecture within the west coast of Malaysia. Subsequently, Alex also described the ornaments of the fascia and their development in parallel with its orientation: “It started from the petals of a lotus flower and after that [into] a different form,” which the author observed as a

²⁶¹ “When rain falls, [the banana leaf] sags, [which then came] the splash of water,” hence the essence of this was said to inspire past *tukang* to incorporate the function as well as its aesthetics onto *pemeleh* of Terengganu Malay houses.

²⁶² Alex provided examples: “Sometimes, in those days (..) they hang *selasar* from *Rumah Bujang* (main house) using ropes or wires, later on we used *tupai* [in addition to] nails and bolts. (..) [When] we do research, we saw some evolution with the hanging method, [the later *tukang*] has come out with different solutions.”

Selasar: A connection, jutting out from the main house.

Tupai: is literally translated as squirrel. However it is also meant to describe a woodcutting that is mounted on a wall or poles for supporting other components. The author suspects that the literal word may be used as was observed in the past, where squirrels were seen climbing tree trunks vertically, hence the similar character.

simplified geometrical pattern and eventually a complete absence of carvings later on.

The findings that were based on development in physical forms were also related to progress in the language used. Prior to assembling *Terrapuri*, Alex was determined to preserve not just the tangible aspect of a house but also the intangible. From his interviews conducted with owners, descendants or *tukang* of houses preserved, Alex noted fragments of words used to describe building components that had disappeared in time, though few uncovered, a phenomenon of great significance for this research. One notable example is the word to describe a beam, particularly the roof beam: “when interviewing an old lady, I noticed that she didn’t say *alang* (beam), but ‘*pak mayang meniti*’²⁶³.” Rarely such words are beings used by current *tukang*, hence the unfortunate loss of a literary segment within the building culture.

In short, the disassembly and assembly process could potentially provide an alternative to the discovery of building techniques and historical developments in various Malay houses built by numerous anonymous past *tukang*. The experience in the process as an observer and as a ‘builder’ is specific to the level of knowledge and skills gained in this process. Nishak concluded her experience in disassembly and assembly: “It looks complex in terms of skills. I could not imagine how [past] people built the house (referring to the Pahang house). I can’t imagine due to the many limitations,” that people in the past had to endure. Her bemusement still exists, “Even though I only knew the house in theory from reading [or] discussion with *tukang*, and even the fact that I also lived in a *kampung* house,” therefore suggesting that a hands-on experience, to a greater extent, provides further wisdom in the past technique of building Malay structures.

4.2.5 Managing Malay building

In traditional Malay house conservation management, *Tukang Jamal* insisted that *tukang* must have, “high commitments,” as the building

²⁶³ *Pak* is a title to describe the status of a living thing, usually of a man; *Mayang* is described as a flimsy or a wobbly character whilst *Meniti* is literally translated as ‘walking on a bridge’. The term was used to portray the similarities and frequent encounters with geckos (*cicak*) crawling on the beams, roof structures and ceilings, a typical occurrence in Malaysian houses up to the present.

process deals with multiple individuals and that time is limited. Therefore in his workshop, Tukang Jamal works hand in hand with Tukang Ahmad to complete their projects. “Tukang Ahmad is my partner,” he explained. “He (Tukang Ahmad) gives commitment on the works (in the workshop) while I look for projects.” He comments that, “Tukang Ahmad’s work is satisfactory, I just keep watch.”

As observed during fieldwork, the division of work between Tukang Jamal and Tukang Ahmad was ambiguous as there were occurrences where Tukang Jamal was involved directly in the making process and will continue doing work all by himself at the workshop after everyone has left²⁶⁴. Meanwhile, Tukang Ahmad’s vast experience gave him the approval and independence to run the workshop and give direct orders to apprentices and other workers. Meanwhile, the work either on-site or at the workshop, conceptually or technically, can be seen being negotiated by both Tukang Jamal and Tukang Ahmad from time to time.

In particular, estimation in the measurement of timbers to purchase and use for a certain project was discussed by both, “agreeing how many feet (length of timber) to buy.” Fortunately, the estimations were, “normally accurate,” determined to prevent excess wood, explained Tukang Jamal²⁶⁵. This is similar to qualities of past *tukang* where materials were acquired at the right measurement with less wastage in respect to the environment. In addition, Tukang Jamal stresses: “Purchasing them directly from forests is cheap and the required size is possible to achieve,” resonating with Tukang Azih’s comment on the difficulty of finding the necessary timber sizes from the market.

At Losong Haji Su conservation, the hierarchy of actors involved was observed: Tukang Azih works alongside his brothers, who are proficient as *tukang*, his sons that can be classified as apprentices and other workers attending the site on a daily basis, except for Fridays. Nonetheless, what was important is that workers were paid on a daily basis. There was one incident that happened on-site; while Tukang Azih

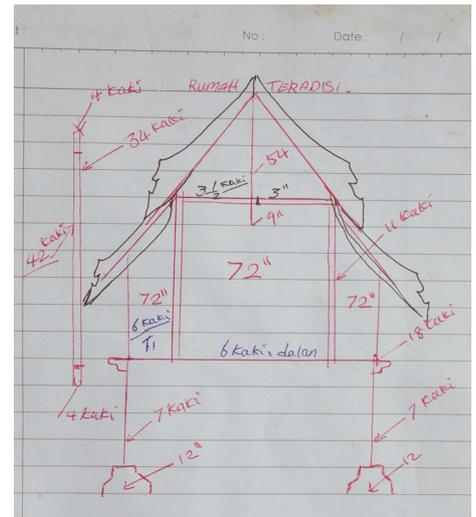


Figure 4.7 Sketches of a house elevation by Tukang Azih depicting the dimensions.
Source: Author, 2014

²⁶⁴ The author assumed that due to the location of the workshop - next door to his house - Tukang Jamal treats the work and his workshop as an extension of his private life.

²⁶⁵ The rule of thumb for the price of the project inclusive of labour and other factors as explained by Tukang Jamal: “If teak timbers, to estimate (costs) you quadruple the cost of the capital (material market price), if other timbers, the capital is multiplied by three.”

was surveying the building works, he noticed a worker had gone absent and he sighed due to this attitude. He later ordered the other worker to look for anyone interested to join working on cleaning the restored roof tiles for the next day. This simple gesture and spontaneous concept of 'labour' is a mixture of old or rural and contemporary system in the building industry that still exists.

In reference to a house conservation derived from salvaged multiple Malay houses, the timbers may vary in size, thus requiring special arrangements for organizing and storing spare timbers for later use. "The way they mixed timber from other houses is mainly determined on the [component] sizes. Terrapuri had graded timber sizes that could be sourced out to houses that require additional components," and according to Alex was due to abundance of the houses dismantled components. The grading of timbers based on sizes was concurrently documented as, "every time we discover something, our photographer documented the different types of *pasak*, jointings, *larik*, *kuku kambing* (types of connection) and others. This is the information that we will get," and had acquired throughout the years.

Managing building components also requires the ability to identify potentials and limitations. The process of disassembly and assembly in the past and present requires one to deal with affected components that have rotted or ceased to function. Timber replacement is necessary as each component plays a part in the stability of a house. In the case of the Pahang house, Nishak explained the part of the house where the kitchen was, "were [using] new woods (of *meranti* type), therefore the timbers were decayed and not worth maintaining. [Fortunately] the columns and roofs (structures) could be reused, so we only recycled these."

Even supervising the relocation requires consideration of vehicles and logistics. One of the aspects was to identify and establish the length of house components, as Nishak described: "[We] used two 2-tonne lorries, [but] the timbers were 32 feet in length, more than the lorries. [Moreover] the tyres exploded on the other lorries, which brought back the stone foundations," due to their weight, hence planning must anticipate such obstacles.

4.2.6 Work coordination

The construction of Malay houses requires systematic procedures such as preparing for the building components and the assembly process on-site. In what seems to be a common fact recently, *tukang* are mostly building *wakaf*¹¹⁰ rather than houses. This is understandable, as the construction only requires, “two people because the timber components are small compared to the length of a house,” explained *Tukang* Jamal. In contrast, Alex claimed that three of his workers had, “dismantled and fixed a house due to land erosion (..) within 3 days, [but] it’s only a *bujang* house (basic form of Malay house).”

With regards to this, Alex suggested that six people would be a perfect number for a house, which was also applied at the Pahang house. Nishak concurred: “Six people are needed to disassemble and assemble the [Pahang] house. No one else (other than the six) can work on the house, due to the concern that they (others) couldn’t understand (during the assembly process).” She continued to describe the hierarchy: “[While] two out of six are skilled workers the others are labourers. (..) The chief makes the markings before disassembling, the others will observe how to dismantle it, systematically.”

This resonates with the method and system of *tukang* explained by *Tukang* Jamal to have 4 groups of people: (i) One who marks, (ii) one who makes *parit* (trenches), (iii) one who makes the mortises and (iv) one who cuts and saws. He further explained: “Once marked (timbers), everyone has to follow, therefore the ‘marker’ should make sure that all markings are completed (..) because everyone will wait for the marker to give orders.” While the master may be in charge of the markings, some may rely on the assistants, as Nishak described of a Pahang house: “*Wak* is the master, monitoring and coordinating works (on-site), but he is old. His son does all the markings as he is still young and could climb,” which hints at another physical trait required. “I don’t do it, I just followed *Tukang* Ahmad, to make it easy,” claimed *Tukang* Jamal acting in more of a managerial position.

Meanwhile, Fauzi said that it normally took them 1 day to restore one house, but, “three days if the details are complex or intricate.” For a Pahang house, it takes, “5 days to dismantle and stone foundations are collected, working from 8am to 5pm,” explained Nishak. The restoration

process conversely proves different in terms of time, depending on certain circumstances that could take years to conserve²⁶⁶. In order to relate, “*Salam (tanggap)* takes one day, eight hours (to make),” by a *tukang* using modern hand machinery, explained Fauzi.

The lengthiness in building the Malay house is due to its rigorous process. *Tukang Azih* highlighted his process and tips (*petua*) in building or rebuilding the Malay house, as quoted in sequence:

“[1] Making mortise and tenon joints (menanggam); [2] Determine the procedures; [3] Align the long beams (alang panjang); [4] Arrange the short beams (alang pendek); [5] Bore through the tunjang langit²⁶⁷, straighten it; [6] [Specifying the size as] size varies. How tall is the house [was determined]. If the house is 7 feet high, make tunjang langit to reach as high as 7 feet. One could not complete [the process] in a day. [Afterwards] make holes at the top on both sides [and] bore holes on the lower part, cut the sides and insert (as mortise and tenon joints); [7] Columns complete, [then make] trusses (kekuda). [8] Trusses completed, fasten the beams (alang muda) [and] Pegged it (using timber dowels); [8] Measure the backbone or bone ridge (tulang rabung) [on] the top part. The bone ridge is a continuous timber [therefore] had to make holes (on bone ridge) first; [9] Insert all three elements (trusses, beams; alang muda, and tunjang langit); [10] Make Pemeleh⁹¹: it is a tedious [process]; [11] Insert long timber beams; [12] make the columns. Everything will be perfectly fit - but don't change front to back (or vice versa), if not, it will not fit.”

Tukang Azih gave a detailed procedure for the roof assembly prior to other building components. He insists that the assembly (or disassembly) should follow these steps: “Assemble the trusses first, before *alang muda* (beam) - as the *alang muda* uses a *pasak* (peg) - it could not be

²⁶⁶ Alex recalls his experience at Terrapuri: “Some (building components) were already painted [therefore] we had to use acid to clean them. That’s why it took us about five years to restore for the first stage (30 houses), but for the rear of the site (referring to the new extension to *Terrapuri*) we need at least two more years - a total of seven years.”

²⁶⁷ *Tunjang Langit* is literally translated as Spinal Sky or Cord Sky, used by *Tukang Azih* to describe the vertical components within the roof pitch structure, acting as standing backbone pointing to the sky.

lifted or raised down (when intact). (..) [However] to disassemble, take away *alang muda* and *tunjang langit*, it can easily be taken apart.” According to Tukang Azih, if these procedures were not followed systematically, it could ruin the connections as when inapplicably forced, they could break. Apparently, he mentioned: “Making columns is easy, (..) [also] the roof is not that difficult, [but] the staircase is crooked [therefore] complicated.”



Figure 4.8 The disassembly and assembly process requires the understanding of procedural techniques as each building components are assembled based on sequential order. Source: Author, 2014

Equally important, Tukang Ahmad portrayed the building process of Terengganu houses in three basic steps: “Starting with [1] columns, lay it on the ground and choose (consists of six columns); [2] Insert the lower portions (three lower ground beams in *tenon* holes); [3] Lastly the roof.” This is describing the process of assembly - from ground up - however; in disassembly it is reversed, from top down. Likewise, the completion of all the components is essential before anything else which was highlighted by Tukang Azih: “Everything should be completed (components), even the new ones (for restoration), before assembling,” suggesting that the house depends on the completion and perfection of each components for it to stand, structurally.

Disassembly and assembly occurs multiple times within a newly-built Malay house, as described by Alex:

“When they start building a new house, they will try to build piece by piece and assemble them, and after that they will disassemble again. For example - the roof part -they build it and assemble at one place (..) to achieve the right proportions; where everything can be fixed (before final assembly). Then disassemble again. So the roof part they’ll do it in one portion and the main body part in another. After that they will bring it to site and start assembling accordingly. That’s why it is called pasang rumah (assembling houses).”

While restoring Malay houses, disassembly offers insights into the condition of these artefacts structurally and aesthetically²⁶⁸. However, the process of disassembly and assembly should be made systematically as components should be restored in their original placement within the structures. Nishak reported on the complexity of the Pahang house: “The mortise on the columns (connecting to the concrete foundation) is difficult to fix within the tenon holes, because the holes are not the same and each was designed specifically for its original, therefore matching it was tedious, (..) as the concrete (foundation) was cast in situ.”

Another problem such as with Dutch style Malay houses is that *tanggam* joints were often developed specifically to accommodate certain forms, as Alex commented: “In *potong Belanda* (Dutch styles), a lot of damage [was encountered],” due to the error in unforeseen disassembly. Therefore, “we tried and are currently studying with Tukang Awie and son²⁶⁹ on how to do it appropriately,” and more importantly, systematically as such houses have more details than normal. Conversely, Tukang Ahmad mentioned the components that are

²⁶⁸ In the restoration of a Pahang house, “the house looks fine, doesn’t sway, but once dismantled you could see that most of the components were affected by termites. A lot [of building parts had] to be replaced,” Nishak explained.

²⁶⁹ Tukang Awie and his son worked at Terrapuri. Tukang Awie was one of the two persons who relocated the Bujang house within 3 days as described in the earlier section of 4.6.6. Meanwhile, in the author’s visit to *Terrapuri* in 2015, his son, Alhuzaiifi Alwee, was said to have left to work as a deep-sea fisherman. Refer section 3.2.5.

normally damaged in Malay houses were the *pemeleh*, *kayu panjang*, *tulang perabung* and *gulung*.

Within the modern context, heavy machinery is employed such as excavators to lift up building components in comparison to the use of villagers' participation in the past. Nishak explained the process in erecting the main structures of a Pahang house: "The main column (*tiang seri*) is connected with the beam, [which is] then raised up using excavators, [with the help] of timber supports (*kayu sangga*)," which indicate that the traditional wood support method is still employed.

Complementary to this, the main column (*Tiang Seri*) is thought to be the focal point of the house. Tukang Jamal clarified that the central point of Malay house is known from, "correct measurement of the width (*buka*) and length (*panjang*) of the house." When this is identified, he declared that there is a, "single trait' (*sifat tunggal*) that is located in the *Tiang Seri* (main column), and that it lies at the centre." In contemporary terms, it hints at the method of 'setting out' point in finding the location of the build, which in this case is cued from the location of *Tiang Seri*, often advised by *pawang* or *Imam*.

4.2.7 Marking system

An essential part of the disassembly and assembly are the markings. "The marking starts during the (earlier) process of building the house," where a chisel was commonly used, explained Alex. The timbers are marked as, "what a chisel can (or cannot) do," hence it leaves permanent imprints. Markings using chalk, "was for earlier stages," however the, "numbering [tends to] fade." On the other hand and more importantly, marking functions to visually, "join the components that have the same marking," Alex adds. He further described that markings, "are usually located below (the lower part of the house; hidden from plain sight)," thus had benefitted his conservation works and eventually for future reassembly²⁷⁰.

²⁷⁰ Alex claimed: "It was easier for us [in *Terrapuri*], since there was a (previous) marking. Some could not be seen; therefore we had to clean [the building components], (..) hence why every process [of restoration] includes washing." In the case of the Pahang house, the author observed that a mix of letters and numbers were employed during the restoration as Nishak explained: "before



Figure 4.9 The use of markings on the building parts using marker pens. Source: Author, 2014

Alex narrated the marking process: “The head *tukang* will do the marking or ask the assistant to do the marking, when he sees fit. This is why they assemble first²⁷¹, when satisfied; they will mark, disassemble and build on-site. So *tukang* know the location (of the components),” which is also mentioned by Tukang Ahmad; “[We] mark on the timbers only when finished assembling (initial assembly for mock-up).” This is in order to mark components to their exact members, which is mainly for the main structures. In contrast, some components, such as the *Janda berhias* wall (interlocking framed wall panels) have no markings on them²⁷². Alex also made a point that markings were, “almost the same [pattern], so you just follow,” or improvised. He further commented: “[Although] most of the buildings have [markings], some *tukang* never used it,” hence could only mean that these *tukang* might be highly skilled²⁷³, as what was claimed by Tukang Ahmad.

The author examined Tukang Ahmad’s proficiency in the markings system practiced. He recalled: “There are [marking system] in the past, [hence] when observed (past technique), we subscribe to, [mimic and learn] from there.” An important point highlighted by Tukang Ahmad is how he improvised the system as quoted: “However to organize (implement the system as per the past) is impossible. Therefore, we developed our own (system).” He continue: “Old houses have their own method, but [the letter] ‘T’ (marks)²⁷⁴ always indicate the centre of the

dismantling (for restoration), [we] made markings using alphabetical letters and numbers.”

²⁷¹ This is common for preliminary assembly to occur, particularly the roof structure. In the conservation of Losong Haji Su, Tukang Azih assembled the roof structure on the ground first. Meanwhile, a complete *wakaf* was pre-assembled in Tukang Jamal’s workshop prior to it being relocated to a permanent site.

²⁷² When asked about the author’s encounter with markings found on these walls at Tukang Jamal’s workshop, Alex replied: “The markings were probably made recently because normally they (*tukang*) assembled it (*janda berhias* wall) first (as a prefabricated wall) [then] they brought it up (install within the structures) as it was. If someone dismantles it they will damage it (..) therefore in *janda berhias*, markings are not visible unless they dismantle it (afterwards in the future).”

²⁷³ See section 4.3.3.3.

²⁷⁴ The letter T, as claimed by Tukang Ahmad, can be considered to describe the word *Tengah* which means ‘centre’, however one must understand that in the past, the Arabic lettering system or *Jawi* was practically used in Malaysia, which therefore speculates that the markings were not merely the letter ‘T’ or that these houses were built after the introduction of the Roman lettering system.

house,” therefore in contemporary restoration process, though, “old houses when disassembled and have markings [of their own], we use our own markings²⁷⁵ for the assembly [instead].” Tukang Ahmad justified: “When we apply this method, it is something we can easily understand, as each *tukang* varies (in style and technique).”

4.3 Malay Building Culture

The Malays are fond of the *pintu gerbang* (archway gates) as they are influenced by the, “symbolic form of the mountains,” described Nishak. Based on folklore and myth, the Malays were claimed to be, “Originally from the Hills of *Segantang* in *Mahameru*,” and therefore had a great deal of devotion to it, she argues. A brief observation of a Malay house by anyone will roughly conclude that it shares the essence of other Malay crafts²⁷⁶ in its reference to nature, evident strongly in the embellishments and carvings of the house. Nishak resonates Haji Yusof’s remarks of the past: “Old folk did not make things unnecessarily, but based on something,” and in this case nature becomes their main orientation or preference. The ‘archway gate’ was similarly adorned as an ‘art of making’ within Malay building culture. However, currently “neglected over so many years by Malay *tukang* [although many] attempts were made to build, [albeit] failed in its concept,” explained Tukang Jamal.

The *tukang* have their own legacy and pride to fulfill hence, “*tukang* make things that become a cultural object or heritage, not an object that could not ‘speak’ for itself, [and that] the object should belong to them (Malays).” Haji Yusof’s remark compares the affections of Malay people in the past with the cultural values and religious inclinations. Thus the building culture of traditional Malay houses as described in chapter two

²⁷⁵ Tukang Ahmad’s marking system is explained: “If in front (building components) is [marked as] ‘A’, centre is ‘T’, [and rear] end is ‘X’. Others [building] parts [are marked] as ‘I’, ‘II’ (centre), and III [accordingly]. Same goes to the top (with connection to the roof).” He explained the advantage of this is, “when looking for components, ‘T’ will always be the centre (regardless of top or bottom).”

²⁷⁶ When researching traditional Malay houses, it is wise to look at other Malay crafts, which could inform the Malay building culture. Dr. Fawaz explained: “We make comparative [study] with other Malay crafts (..) [as] you will not find it (meaning of Malay building craft) only within our own (Malay architectural heritage).”

was the result of the legacy instilled in Malay *tukang*. Haji Yusof further states the Malay *tukang*, “vowed with his tongue, affirms in his heart, the spirits of Malay-ness, in which Islam is strong (in their hearts) [hence] the ability is from Islam.” The quote suggests that aside from the cultural values embodied in Malay *tukang* - from Buddhist and Hindu traditions - there is also a, “significant relationship with religion (Islam),” that is a fundamental aspect of their lives, he adds.

Islamic affiliations within Malay *tukang* are reflected in the timeframe of their daily labour activities. The Malay culture of work was adopted based on the time of prayer (*salah*) bestowed upon the people of Abrahamic-beliefs as described in section 2.2.7. *Tukang Azih* illustrates the aspect of *salah* time with the period of labour²⁷⁷. Apart from timing as being efficient, it is also believed to, “spark the (*tukang*’s) creativity,” as quoted by Dr. Fawaz of a carver’s schedule:

“In the cycle from morning to night, when light is a concern, the best time for *tukang* (to work) is between 9 and 11am, beyond that it will be too hot. Then [the *tukang*] continues working from 3 to 5pm. (..) At night, [*tukang*] sketch and observe the silhouettes [of their carvings]; which determines the form or whether it (carving) is right or wrong.”

The concept of time based on Islamic prayers extends to the definition of Malay work culture of physical labour of ‘unmechanized occupation’ structure without ‘fixed hours of work’ (Alatas, 1977). It is possible to suggest that *tukang*’s work submits to cultural canons that complement the notion described by Alatas. As a result, the concept of labour within the past Malay world is viewed as contextually and culturally relevant in contrast to the capitalist systems of colonial powers and of today.

²⁷⁷ “Traditional people start working after Fajr prayer (in the morning before dawn), Zuhr (afternoon) and Asr (in between noon and dusk) time for rests,” and normally after Asr, they will head home to their family and tend to their livestock or plantings, if any. By Maghrib (dusk) as recalled by the author’s childhood experience, the Malays are normally at home, with most of the house openings closed to prevent devils or bad spirits from entering. At that moment, it is said that the devils are lingering and rampant: another Malay belief that exists until today.

Another reference to time lies in Dr. Fawaz's poetry²⁷⁸, as translated by the author:

"Non-sensible²⁷⁹ days..."

While the late Nik Din was still here, he mentioned about the matured days. "To the tukang, today was a fine day, where semangat or passion for carvings and the wood at hand unifies; making the work/craft easier as well as having already a sharp knife... and eventually produces a great masterpiece".

"If the tukang (carvers) force themselves to produce a carving; mishaps will occur... if an artists continues painting; ideas will perish, if the writer tries to write; this happens... I can only embrace the fact that this world revolves not only within yourself..."

A great *tukang* adores a particular day, a sensible day and this is portrayed in Dr. Fawaz's poetry above to describe the aspect of spiritual solace of a *tukang* in relation to other non-tangible elements such as time²⁸⁰. Dr. Fawaz's close relationship with the late Nik Rashiddin, a master *tukang* or carver, an authority on the topic of Malay craftsmanship and his personal *guru*, suggests a direct and unfiltered

²⁷⁸ Original wording in Malay: "Hari-hari yg tak matang...Ketika arwah Nik Din masih ada beliau pernah menceritakan mengenai hari2 matang. Kepada tukang hari ini sangat baik, dimana semangat untuk mengukir dan kayu yg di pegang bersatu menjadikan kerja lebih mudah disamping punyai pisau yg sudah sedia tajam...maka terhasillah karya yang agung. Jika tukang memaksa juga untuk membuat ukiran, akan terjadilah kecelakaan... jika pelukis meneruskan lukisan akan binasalah idea, jika penulis cuba berkarya inilah jadinya.. .aku hanya dapat berpegang kepada kenyataan yg dunia ini tak berpusing pada hanya diri sendiri...."

²⁷⁹ Matang can be translated into 'mature', however the word 'sensible' better describes the actions done according to wisdom.

²⁸⁰ Dr. Fawaz inspiration comes from his personal experiences of meeting a master *tukang*: *Ayahanda* Latiff Long. When visiting him, Latiff Long accentuates on the meeting in relation to the current surrounding described rather poetically by Dr. Fawaz: "The day we met him was in the leap year, February 29th and it was Friday (a sacred day for Muslims). Before we came it was raining, we visited at around 10-11 o'clock (a good time to produce crafts according to Dr. Fawaz), the rain is *sedang* (mild), the rain had *sirat* (reduced visibly), rain waters were still in puddles, weather was so nice, Latiff Long said we came at the right time to learn *Kris* (a type of weaponry crafts)."

knowledge of craftsmanship was not only based on creative endeavours but also spiritual. It is common that previous generations of *tukang* held dearly to their Malay culture and this is a major component in their association with their crafts as well as in the passion to continue in preserving them.

A *tukang* depends on their relationship with the past (Gibbs, 1988; Noor and Khoo, 2012; Winstedt, 1929) hence, the poetry attempts to relate the craftsmanship of a *tukang* with their inner self, notion of time, past legacies and the current state of being in the environment.

Moreover, a 'sensible' day resembles a day in which the *tukang* is full of energy and compassion towards his work, making the work easy, fruitful and successful. The innate experience of the *tukang*, the materials and 'spiritual guidance' informs the actions towards their craft, whereas, in 'non-sensible days' a *tukang* should not compromise by attending to his works as he will not find 'success' in the actions and according to the poetry, there are greater powers at work besides the *tukang* himself, which resonates with the concept of *guru asal*²⁸¹ described by the late Nik Rashiddin (Noor and Khoo, 2012, pp. 11-12).

4.3.1 Words, Poems and Proverbs

The attributes and life of Malay *tukang* can be associated with Malay proverbs that were commonly used in the past as a means of communication or expression, however forgotten among new generations. For example, *tanggap* may seem to be widely used, but Fauzi often used the word *salam*²⁸², as the best term to represent the act of connecting pieces of wood. Meanwhile, Dr. Fawaz highlighted an aspect of Malay language, although insignificant, emits its own meaning. He relates to Nik Rashidin's common choice of word among his jargons used in craftsmanship, fabricated as "Nghaa!" The make-up word does not resemble anything but the potency of craft that is insufficiently described if using Malay language alone.

²⁸¹ The concept of having spiritual relationship with previous generations of masters, mainly through some mediums such as artefacts. Refer Section 1.1 (ix).

²⁸² *Salam* is translated as to proffer (shaking hands) hence the literal meaning in the physical appearance and function of wood connections.

Meanwhile, proverbs are sometimes direct and most of the time symbolic to other means²⁸³. Alex mentioned in relation to his ethnography experience while collecting over one hundred traditional houses in Terengganu: “We still found short paragraphs (proverbs), but there were no relationship with each other as for now.” Most of these proverbs he adds, “Has its philosophy, motivation, message and small meanings behind it,” thus the, “artisans those days embraced these characteristics (positive outcome from the proverbs),” hence some *tukang* are capable of spontaneous poetries²⁸⁴. Alex relates to Abdullah Nakhoda’s abstract poem that wisely explains the principle of woodcarvings²⁸⁵, which Alex claims to, “implicitly expressing a part of the [characteristics or values of a] Malay house.”

Haji Yusof similarly described the use of proverbs or idioms that, “[Directly] portrays the life of Malays,” especially towards Malay *tukang*. An example was relating to houses such as ‘*rumah tangga*’ or directly translated as ‘house stairs’, which is literally describing the aspect of marriage or anything related to activity of and within a family. Others such as ‘*sekali air bah, sekali air berubah*’ meant that ‘every time it floods, every time the water (riverbank or route) changes’, “Represents the river as the highway and a method of communication,” of past community. This in Haji Yusof’s opinion is for Malays to, “Questions [on] how to survive (within the living conditions of frequent flooding),” hence he concluded that the Malay *tukang* created the ‘prefabricated building system’ as part of their reaction towards the built environment.

In a similar context, the proverb ‘*kalau takut melawan ombak jangan berumah di tepi pantai*’ hints with a sarcastic tone translated as ‘if you are too scared to fight the wave, do not build or live in houses at the sea shore’ and according to Haji Yusof: “Malays and their craftsmen are as brave,” and fearless of natural forces. “Problems can be solved from different iterations and corrections,” within the development of traditional houses, he adds. This is evident in the contrasting heights of houses on the coast and inland as described by *Tukang Ahmad*.

²⁸³ Ariffin (2001, p.56) notes another word for *bendul* (threshold - building parts surrounding the Malay house) as *larian kucing* (cat’s running path), ‘meaning track or rail path used by cats.’ This is often as a result of what was observed or closely related to man.

²⁸⁴ Dr. Fawaz described Latif Long - a master *tukang* - whose spontaneous poetry was rich in high Malay proses that conveyed his creativity.

²⁸⁵ Refer section 2.1.2.3

The author noted the loss of traditional proverbs was less significant for the subjects (mostly *tukang*) or was deemed only relevant to past Malay building culture. Hence it is less appreciated in current *tukang*'s practice. While it may seem to be appropriate at one point (as hinted by Alex), although indefinite, may somehow be forgotten or unverified within the Malay building culture. Compared to the other parts of Asia, especially the Dong People in Southwest of China, traditional proverbs and songs carry the meanings of local building tradition and procedure, which are passed down and practiced until today²⁸⁶. Other methods include stories, legends, folklore, rituals and laws (Acharya and Shrivastava, 2008).

4.4 Skills and Tools

The skills that inevitably define the characters and attributes of the Malay *tukang* in this section are derived from the standpoint of the subjects and thus interpreted to reflect upon issues within the Malay building culture. The fundamental aspect in building Malay houses is the, "knowledge in using wood for making [and] type of woods [used]"²⁸⁷, as simplified by Fauzi. However, others have defined different factors that contribute to the notion of Malay craftsmanship within the building culture.

4.4.1 Malay Craftsmanship

Tukang Jamal defines good craftsmanship in terms of three attributes. The first is '*Kehalusan* (fineness),' which relates to the intricate details of *tukang* masterpieces. Second is the 'Satisfaction to himself' that was based on his early intentions to achieve perfection. Lastly is 'honesty': avoiding exploitation of others and himself through wisdom. He concluded by emphasizing that, "Skills are a higher priority than wealth," which is the ultimate form of devotion towards the act of making.

²⁸⁶ See: Kong, D., 2016. The Dong Oral Architecture: Carpenter, architecture and phenomena among the Dong people in southwest of China (phd). University of Sheffield.

²⁸⁷ The author observed the aspect of *tukang*'s understanding in materiality to reflect upon the composition of the materials: such as *berselirat* (reticulated), compression values, colours or whether malleable for carving.

In addition Alex believed that, “Traditional and modern *tukang* are almost the same, except that traditional *tukang* were more meticulous and more refined in their work, although machines were then uncommon.” This is due to the fact that, “Discipline [in the past is] really hard to imitate,” where the works of a respectable *tukang* was perfectly distinct, he adds. Portraying meticulous details in the workmanship alone is not sufficient for success as Alex emphasized: “[*Tukang*] need to understand history, to read, to discover them,” and similarly to have interests in both the subjects (Malay houses) and the building practice. It is worth pointing out the aspect of ‘discovery’ advocated by Alex above and to question the opportunity it has within this study.

Subsequently, *Tukang* Jamal’s definition of a good craftsman is one who is, “Cautious and observant [while] the crude and careless are common.” An interesting point to note, Dr. Fawaz adds to this description by illustrating the quality of a *tukang* from his ‘aura’. A *tukang* has an aura that, “You can ‘feel’ it.” One example is when a *tukang* has the ability where, “He can read you (in physical and non-physical sense),” which may suggest that a *tukang* manipulates similarly with his masterpieces or artefacts, intellectually and conceptually. Most definitions maintained the aspect of discipline as an ingredient for excellence in Malay craftsmanship.



Figure 4.10 *Tukang* Jamal utilising modern equipments to create mortise holes for *tanggam* jointing techniques. Source: Author, 2014

The author's observation of *tukang*'s work on site was commendable, as they were hardworking and in constant errands. It may be due to a *tukang*'s busy schedule to complete the tasks at hand while always in demand by the apprentices as well as the project managers on site. Important aspects in the work of the *tukang* as observed were the continuous on-site requests for work consent, inquiries from apprentices and workers as well as his own labour²⁸⁸. This is in contrast to the account by Alex: "[The] discipline nowadays for *tukang* is uncommon," which may have been intended to describe the aspect of meticulous detailing of past *tukang*, which now could only be completed by using machines²⁸⁹.

With the introduction of modern machines and equipment in the Malay building process, Alex agreed that the *tukang*, "Works faster using hand machines than traditional tools," and sometimes better²⁹⁰ - as is the case when adopting technology in any practice. Likewise, Dr. Muhammad recalls his grandfather, a well-known *tukang*, "Uses *ketam kembung* (type of jack plane) to make *papan kembung* (extruded-wood-panel), but now router machines were used, which is effortless." These details interestingly distinguish the work of a master *tukang* from ordinary ones as *Tukang Azih* highlighted that when part of the house has extruded embellishments, there is a possibility the *tukang* was very skilled²⁹¹. Thus

²⁸⁸ At a brief moment during the fieldwork observations, the author recorded *Tukang Azih*'s responsibilities in selecting the orientation of the carving panels, order for the timber flooring safety support to be in place, observing his brother's work in installing ventilation panels and making sure the installation of doors to be placed perfectly.

²⁸⁹ Alex lamented the common solution for a perfect joinery of building components was to be executed by a furniture manufacturer. Similarly, the *Losong Haji Su* conservation project was awarded to a company that largely makes wooden furniture. The outcome of this is twofold; due to requirement of small and precise component-based construction, it is recommended to appoint a furniture manufacturer. Secondly, the use of machines is critical in building traditional houses, hence questioning the need for the traditional sense of a master *tukang*.

²⁹⁰ Fauzi described the current use of machinery in making *tanggam*: "Machine is tidier (perfect) than chisel." This could also suggest that due to imperfections in contemporary timber house-building, contemporary *tukang* may lack the skills of using modern hand tools.

²⁹¹ *Papan kembung* literally translated as bulging wood, though it could be described as an extruded-wood-panel of a building part, normally for wall panels (*papan berhias*) of Terengganu-style-houses. However, *Tukang Azih* specifically

this emphasized a visual aspect of a house; easily identified and which envisage the level of his proficiency in house-building.

In contrast, Alex defined the importance of the traditional *tanggung* building system as a main factor in defining and acquiring craftsmanship. The tenon and mortise joints of a *tanggung* system require perfect cuts, analogous to the craft of making a *Kris*, that *Tukang Jamal* had referred to as the “small craft,” or “delicate craft.” *Tukang Jamal* was trained to make carvings on *Kris* where he claimed that considerations should be given towards the ‘tightness’ and its ‘finesse’. Conversely, making a large structure such as the Malay house compared to a delicate craft was highlighted by *Tukang Jamal*: “[When] one goes from small (delicate) to big (rough) it becomes beautiful but from big to small, probably may not be possible.”²⁹² Hence the background skills of a *tukang*, especially in making smaller crafts, adds value to his mastery.



Figure 4.11 Extruded embellishments on a roof beam of a house in Terrapuri.
Source: Author, 2015

Despite this, according to Alex, *tukang* had to, “Refer to another artist,” work or hire other craftspeople, “to make the house beautiful.” Alex gave the example of interior screens (partitions) in a Malay house: “We (Malay people) don’t have [interior] walls and the frames (of partitions) are built by the *tukang* while [the] carving by carvers.” Then the screens

mentioned this type of embellishment feature that were painstakingly made on the roof beams using traditional hand tools.

²⁹² Refer in section 4.2.1; Alex’s descriptions on the ability of the craft brothers, both are goldsmiths, who helped to rebuild and conserved a traditional Malay house at the Terengganu State Museum.

may be sourced from a textile-maker in order to complement the dimensions and 'status' of the house prepared for by the *tukang*. Similarly, the thatched roofs commonly used in past Malay houses were collectively made and prepared by women²⁹³.

4.4.2 *Semangat*, Magic and Myth

Attributes such as an eye for detail, craftsmanship and workmanship were repeatedly mentioned in the fieldwork and resonate with definitions of craft throughout the world. However, what differentiates Malay craftsmen and workmanship are the aspect of local rituals and understanding of *semangat* inherited and embedded within Malay house-building culture. The rituals in the building culture - associated with the four main attributes of *tukang* (Abdul Rahman, 1999) - were cited as the reason that some Malay houses are still standing²⁹⁴ despite using perishable materials such as wood and located within a tropical climate.

While the rituals were seen as an integral part of the house-building activity, there were few mentions of such ritual activities during fieldwork on-site. However, it is obvious and agreed that the view of Islamic rituals nowadays seems to dominate the practice²⁹⁵. The Islamic concept according to *Tukang Jamal* focused on, "moderation [which characterizes the] concept of religion (Islam) within [Malay] craftsmanship." The evolvement and amalgamation of concept from other influences (animism, Hinduism or Buddhism) or mostly inspired from nature, "Changes (commonly in visual form) after the 'Islamisation'," as the traditional artefacts for example, when "'scanned' (observed thoroughly) we may find it to contain other elements

²⁹³ Women played a part in building Malay houses doing meticulous tasks such as roof thatch weaving; hence the proportions of these roof components are often linked to their anthropometrics. See (Ariffin, 2001)

²⁹⁴ The Malay building culture has similar notion to the Chinese 'Feng-shui' such as, "surveying the sun (location), reading charms (..) build techniques, prayer that follows, (..) selection of wood, [etc.]," and therefore these rigours, "makes the house stand until now," claimed Dr. Fawaz.

²⁹⁵ Islamic practices has sustained the building culture as claimed by Dr. Fawaz, where in the past, incantations were used, but prayers replace them.

(influenced by others),” that existed prior to Islam. The development is significant and was as a result of past *tukangs*’ effort.²⁹⁶

Accordingly, the Islamic element in the practice deals with actions relating to Islamic culture. The phrase *Bismillāhi r-rahmāni r-rahīm*²⁹⁷ becomes an opening speech before any undertakings and it was predominant in the actions of *tukang* and apprentices observed. Apart from the opening phrase, some of the verses within the Quran were also used for certain reasons, as such the Ayatul Qursi²⁹⁸. It is an, “Alternative way than to engage a Shaman,” - that was considered fictitious - the verse was practiced and repeatedly recited by *Tukang Azih*.

Acknowledged as part of the current ‘ritual’, this specific verse from the Quran was commonly recited within Malay culture to drive away evil spirits including in house-building. *Tukang Azih* explained: “People are scared of entering (abandoned traditional houses),” as they claim to contain *penunggu* or spirits that are, “embedded in the house by past people.” Most of the houses disassembled, according to him, “Had to verbally pronounce the intentions, before entering and commencing work.” Most of these houses may have ‘ghosts’ inhabiting them, sometimes related to the house *semangat*. However, *Tukang Jamal* added that among others, it is, “unwise to believe in them,” because it is blasphemy to Islamic teachings of One God. Nevertheless, these beliefs are dependent on the person believing and practicing them, as explained Dr. Fawaz.

Aside from the recitations of the Quran, *Tukang Azih* highlighted: “Practice in woodcutting should be made sincerely for Allah (Almighty God),” in which he is referring to the importance of being ‘humble’ for being the slave of the Almighty God. Dr. Fawaz also mentioned the

²⁹⁶ *Tajung* (handle) of a *Kris* - usually crafted finely on a special wood - is a representation of a figure sitting on a lotus petal (symbol of Buddhism), later were simplified. Claimed by Dr. Fawaz, the agreement to develop was based on the *muzakarah* (discussion) between *tukang*, religious individuals, aristocrats and Raja. The results proposed by *tukang* were to trim the ‘feet’ of the ‘figure’ so as to achieve an incomplete figure, where in Islam, some may say that this affect is permissible.

²⁹⁷ The first Arabic phrase in the Quran translated as ‘In the name of Allah (God), the Most Gracious, the Most Merciful’.

²⁹⁸ Translated as the Throne verse, widely recited and memorized by muslims due to its strong description of Allah’s (God) authority over the whole universe.

recitation of *Zikir*²⁹⁹, which convey the idea of, “God is in the detail, God is in the beauty.” *Tukang Azih* further clarifies that the knowledge of Allah is supreme, therefore a *tukang*’s, “intelligence is dependent on Him (God).” On the contrary, past *tukang*, “Have idol worshipping practices which is a bit mystical [and] spiritual.” While most of these practices have discontinued, some remained mainly for practicality without spiritual intention³⁰⁰. Merely a symbolic endeavour.³⁰¹

Meanwhile, Alex believed that the, “House *semangat* inhabits the whole part of the house,” where the, “*Tiang Seri* (main central column) becomes its *penyeri* (charmer).” Apart from being a modern concept of ‘setting out’ point during house-building, the erection of *Tiang Seri* is a crucial part of the main rituals in house-building that were directly involved with village folks through ceremonial feasts. Perhaps the house is technically a system of community rather than a shelter, as claimed by Dr. Fawaz.

The mythical and spiritual were not only translated into the building process but in the tools used and owned by *tukang*. *Tukang*, “Accustomed to *berlimau* (drizzle of lime juice) [and] *berasap* (smoked),” rituals performed on the tools, especially the chisel. Dr. Fawaz believed that the interaction between tools and *tukang* is to achieve a, “peace of mind.” The tools are then, “stored inside a nice timber box which nowadays store the Kris.” Alex confirms that most of the famous *tukang* he interviewed practice similar rituals as were passed down to them to uphold.

Subsequently, the *Guru Asai* concept invoked from the late Nik Rashiddin was contemplated by Alex as merely, “imagination from

²⁹⁹ *Zikr* is an Islamic act where short phrases or prayers to praise the God are recited repeatedly and silently within the mind or aloud.

³⁰⁰ *Tukang Azih* described the practice he uses in the site selection of a house similar to that mentioned in section 2.3.2. This is done by first, “measuring a wooden stick in the length of *sedepa*, penetrating it in the earth for the proposed column (commonly for the *Tiang Seri*). If tomorrow it become shorter, the earth is not suitable, but if longer, better or the *rezeki* (fortune) increases.” Interestingly, the same procedure was also used by *Tukang Azih* to look for ground water, where he claimed to have succeeded most of the time.

³⁰¹ Similarly in 1889, Sultan Idris, the ruler of the State of Perak, could have agreed that the ritual ceremonies was not to be considered heretical, but rather symbolic to the expression of culture and tradition. See (Gullick, 1987, p.34-35).

culture, heritage and all forms of (Malay) arts.” Alex further claimed that *Guru Asal* are, “‘Teachers’ that had taught him (*tukang*),” which had inspired him in a form of, “Dreams, *Wayang Kulit*, *Mak Yong* and *Main Putri*.”³⁰² Putting this into perspective, Alex claimed to have ‘inspired’ *Tukang Azih* through knowledge during the construction of *Terrapuri*. Therefore the *Guru Asal* (teacher) is represented as Alex, while the ‘student’ as *Tukang Azih*, who could then relate his practice with rich theoretical Malay cultural-related ideas.³⁰³

4.4.3 Knowledge and Dexterity

Knowledge and dexterity beyond visual traits is one of the characters of the Malay culture. *Tukang*, carvers and artisans in the past have, “philosophy, motivation [and] messages,” rooted in their routines, therefore past *tukang*, “don’t simply build the house, they have small meanings attached,” claimed Alex. It has an effect in the way Alex manages his conservation works, where houses conserved are treated and kept, “as art pieces.” These houses or ‘artworks’ were said to have been “inspired from palaces in Terengganu [and] Langkasuka¹⁵⁰,” hence the association between what is physical and what is not. In an example of the Malay *gerbang* (gateway) constructed at *Terrapuri*, restored by *Tukang Jamal* and *Tukang Ahmad*, Alex highlighted the process of, ‘imagination and exploration’ as an essential ingredient in making it. Hence, it demands and signifies the aspect of tacit knowledge pertinent in dexterity of past and current Malay building.

4.4.3.1 Knowledge in Malay building

Tukang Jamal insists that skills were secondary to knowledge of building traditional Malay houses as quoted: “It is not compulsory to know how to use a chisel, but having an understanding is more important.” He demonstrated his point as the Malay carvings have, “hidden concepts and philosophy embodied that a layman could not understand (visually).” Traditional craftsmen were always described as people who

³⁰² *Wayang Kulit*, *Mak Yong* and *Main Putri* are cultural performances often related to charming and offering spirits as part of certain rituals.

³⁰³ According to Alex, in their book ‘Spirit of Wood’, *Khoo* and *Farish* were explaining the term *Guru Asal*, rendering it to look more artistic. In summary, Alex simply regards it as something that is merely transpiring.

perform things ‘by heart’, but Dr. Fawaz suggested that in Malay craftsmanship, it is termed as *rasa* (feeling or hunch)³⁰⁴. Perhaps, only a Malay *tukang* could see a Malay house beyond what others may see, as, “our (Malay *tukang*) advantage is the *semangat*,” which is embodied in them.

Technically, by looking at Malay structures, a *tukang* could understand the essentials especially in the aspect of techniques and rational. *Tukang Ahmad* demonstrated the natural instinct of a *tukang* by describing *Losong Haji Su* house as consisting of multiple modifications. It is an assumption made by observing evidence of, “details connection, types, methods and holes (mortise) present.” Perhaps, it was also due to the indication from ways a, “*tukang* utilizes wood [which was] based on their (wood) virtues,” suggested *Fauzi*. Nonetheless, the author had anticipated otherwise³⁰⁵.

‘Hidden concept’ or wisdom in Malay craft is important as it evolved through time and thus may change in form. The type of wood used for example, portrays the significance of the material as well as a reasoned function³⁰⁶. Hence to identify a type of wood is to, “observe the (timber) veins, (..) thoroughly,” explained *Fauzi*. Others such as the *tebar layar* and the staircase of the *Terengganu* houses derived from the concept of *Makara*, a mythical creature in Hinduism. It was meant for a certain location that symbolizes the need, “for the *soul* to see [and to] protect the owner from sea monsters.” After Islamic ideologies arrived, what’s left of *Makara* is the ‘outline’ of it that are an abstract or, “symbolic and not a direct translation,” explained *Tukang Jamal*. “Although abstract, people still understand,” from its, “identity or features that [only] we (Malay *tukang*) understood.”

³⁰⁴ *Rasa* is a Sanskrit word, but in Malay meant as feeling or hunch.

³⁰⁵ The authors observed that the assumptions may have been derived from contrasting wood used that could visually signify the different period of changes through colours and textures. In addition, it could also be described from the additions of the house form that is obviously an extension of *Rumah Ibu* (Main house) However, personal judgments on the hidden jointing, structural aspects and the wisdom of the components of the building was still flawed and in need of an expert such as a *tukang*.

³⁰⁶ *Fauzi* illustrate the use of *Leban* wood used for flooring, although hard to find, “their colour maintains (..) [therefore] does not look shabby [over time].” Secondly he explained: “[Composition of] wood is *berselirat* (reticulated), [where] air could penetrate,” thus increases the airflow within the house.

According to Alex, other forms of alteration include the fascia board of Terengganu houses. In addition to its evolution in orientation from horizontal³⁰⁷ to vertical sideways as seen today, the pattern of the fascia started from “lotus petals and after that [evolved into] a different form.” Similarly, it appears to evolve around common sense based on context and the needs of occupants - however the author suspects that it has all to do with the change of beliefs³⁰⁸. On the other hand, *Tukang* Ahmad justified the height of the traditional house: “Houses deep within the land are higher than ones near the shore,” with the former, “9 feet, 8 feet or more,” and the latter, 6 feet accordingly. He concluded that the difference may be due to wind factors, and as a result, “houses are (always) not the same.” Therefore in order to track the lineage of the transformation or reasoning behind various elements, a *tukang* must equip himself with past and implicit knowledge that had unfortunately been disregarded or lost.

Again, the aspect of knowledge corresponds with the proverbs in the Malay language. An example given was the *bendul*³⁰⁹, that relates to “not to cross the *bendul*” proverb, which according to Alex: “Portrays the lifestyle [and actions] of past *tukang*.” He described a similar proverb that characterized traditional houses such as ‘*melepaskan batuk di tangga*’ (coughing on the steps or staircase), which meant ‘doing something meagrely’. Mentioned by Haji Yusof, it was understandable that proverbs or Idioms, “sometimes reflect the real life picture,” of past Malays. Therefore, in most cases, Alex claimed that proverbs derived from conversations of *tukang* with the house owner, apart from what they have observed themselves. Nonetheless, Alex believed that proverbs depicting traditional houses were literally meant for the *tukang*, “to make things perfect,” in his building culture.

Similarly, the author also observed that all *tukang* when describing joints, relate to the concept of life such as *jantan* (male) and *betina* (female) to define a particular character of jointing used. For example,

³⁰⁷ The fascia in its initial form, follows the orientation of the angled roof tiles, therefore acts as the tiles end.

³⁰⁸ Lotus petals were considered to relate towards Hindu or Buddhist rituals, hence the alterations made.

³⁰⁹ According to Alex, *bendul* “acts as a fastener for the house (structurally) to prevent *riang* or looseness.”

the tenon details are normally described as the male while the mortise as the female part³¹⁰. Furthermore, when there was an element in between - which was normally a smaller component - the term *anak* (child) was used. *Tukang Azih* explained the combination of the three elements: *jantan*, *betina* and *anak* - commonly adopted when joining together two parts of a timber to extend its length - as a strong family unit³¹¹. Thus it signifies the importance of family or perhaps the literal meaning of the past people within the Malay culture.

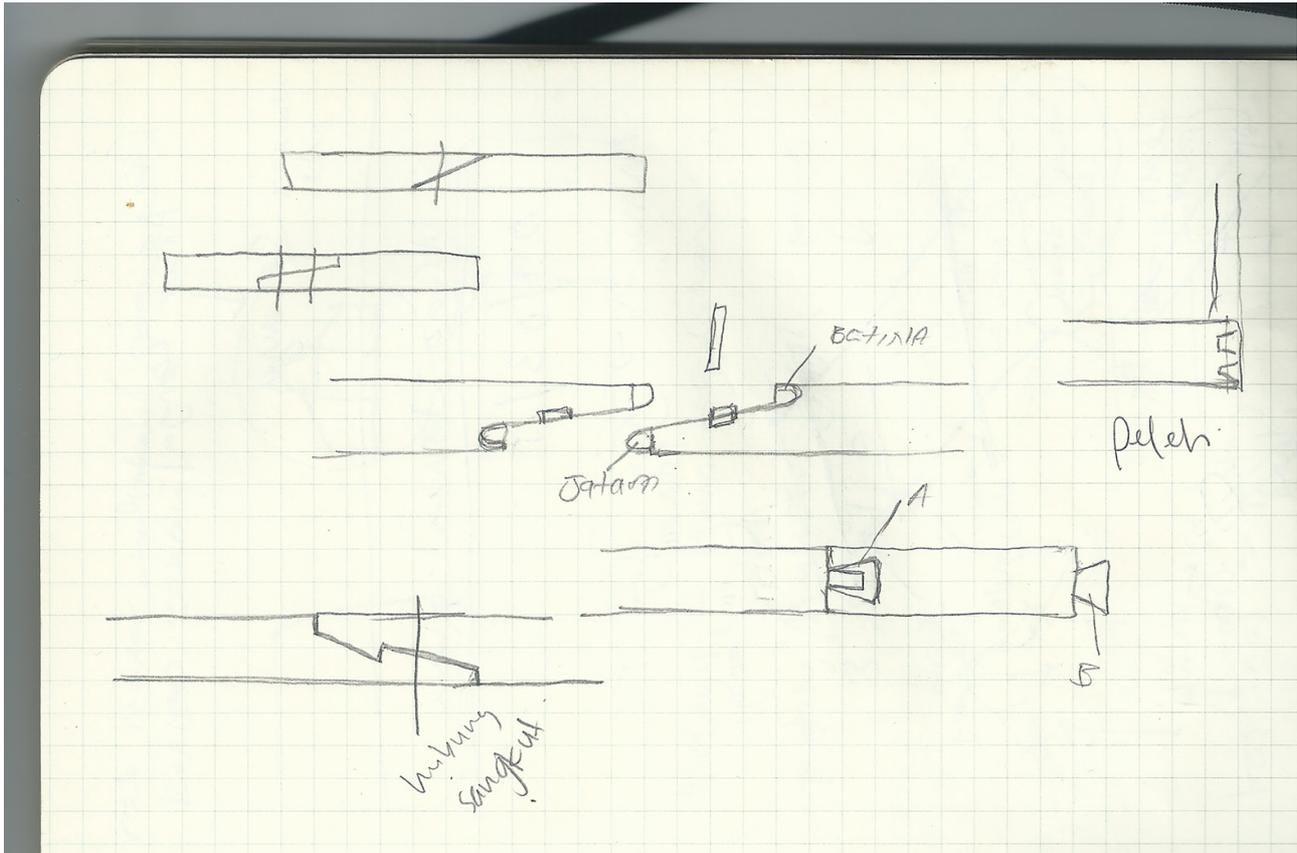


Figure 4.12 Sketch by *Tukang Azih* demonstrating a splicing joint found during disassembly and assembly, to increase the timber's length. The joint depicts the concept of male and female elements that utilise draw pins to secure the timber pieces together. The term *anak* or 'child' normally represents smaller parts. Source: Author, 2014

In technical considerations, past *tukang* built houses derived from measurements of the 'mother of the house'. In the same way, "these measurements are [also] from the *tukang*," himself and therefore, "they

³¹⁰ In the same way, Alex relates to the element of "Makara's enclave and concave," formation as a, "symbol of male and female."

³¹¹ It is claimed that when a child exists, the bond between male and female will become stronger, hence reflecting its function, as described by *Tukang Azih*.

are not only skilled but possess holistic knowledge,³¹² of Malay building culture; hence Alex defines them as ‘pure *tukang*’. Subsequently, in the past, *tukang* had no architectural drawings to refer upon, however could produce perfect architecture as Alex explained: “If the house is to be built at a certain height, the scale of the house [can be predicted] and eventually it becomes the intended form.” In brief, he expressed that *tukang* are, “smart, (..) skilled and gifted.”

The description above is apparent for *Tukang Azih*, where he humbly explained that though he could read plan drawings; they were absent in the building process of *Terrapuri*. *Tukang* traditionally depended on, “plans in the mind,” he adds. In contrast, architects’ work evolves around architectural drawings and documents; however, *Tukang Azih* criticized them for the lack of critical specifics in the conservation works conducted³¹³. The architects’ drawings could not provide the essential elements required for a *tukang* to build; *Tukang Azih* suspects this may be due to complexities, “as the ‘inside’ (*tanggam* detail) is different [or hidden],” and varies from what they have imagined.

In the same way, Alex notes the absence of technical drawings also occurs among boat-builders. The author’s observations suggested that a *tukang* could somehow relate his knowledge of past concepts and techniques in boat-building within the framework and qualities of Malay houses. As mentioned earlier the phrase: ‘A boat *tukang* can build houses, but a house *tukang* may or may not build boats,’ *Tukang Azih* claimed to have the ability to build a boat, hence his conception that boat construction - which happens to be a construction that involves *pasak* (wooden dowels)³¹⁴ - could simply be translated into his making of houses. That being said, the construction of houses for *Tukang Azih* is said to present the same challenge, or if not to be more straightforward

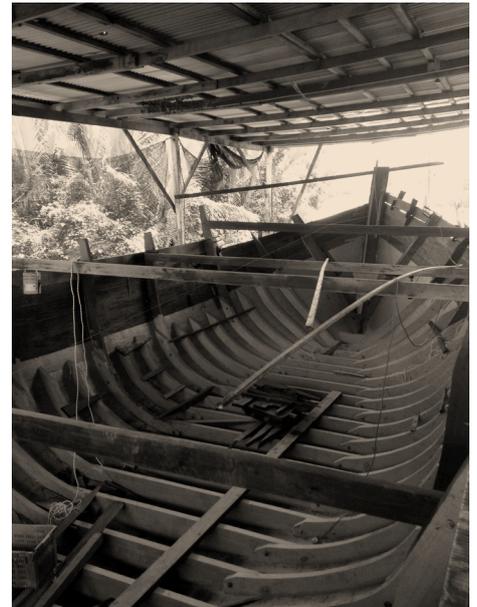


Figure 4.13 Malay boat building has similar values and qualities as in Malay house-building. Source: Author, 2014

³¹² Holistic knowledge refers to the adeptness in rituals and technical Malay building culture.

³¹³ This is in reference to the Losong Haji Su conservation project. *Tukang Azih* commented that the architectural drawings lack the details, particularly referring to the *tanggam* detailing and specifications.

³¹⁴ A Terengganu boat construction often involved *pasak* (wooden dowels) that separates it from other boat construction, hence its reputations for a complex but strong boat character.

than a boat. And yet, the knowledge - even the terminology used³¹⁵ - is nearly the same, but the holistic consideration of the house is given priority in cultural Malay living.

Haji Yusof identified proficiencies that were pertinent to a *tukang*: Firstly having an, “eye and intellectuality,” that are constantly, “related to the concept of religion (Islam)”. Secondly is the knowledge of “mathematics, based on the theory of equilibrium, symmetry [and] proportions,” which again manifested through the concept of religion: *dunia* (earth) and *akhirat* (hereafter). Finally is the understanding of “elements in science, biology and physics,” asserted by Haji Yusof to be evident in the customs and built characteristics of Malay houses.

Likewise, *Tukang Azih* justified the concept of mathematics in Malay houses by saying: “Mathematical knowledge is important [in order to] calculate [and understand] the sizes, (..) if [the *tukang*] is not proficient in calculation, [the house] will be flawed. It is not only performing it but to estimate, [in which] the proportions are (most) important.” Based on his experience, even mature *tukang* he had worked with could not build a house due to lack of understanding of building segmentations³¹⁶. Similarly in the making of the staircases, some *tukang* had tried to imitate his works³¹⁷ but failed. *Tukang Azih* expressed that the *tukang* “should have [initial] knowledge on the height of the house, as not all are similar” as the “staircases are constructed afterwards, after [house] completion,” therefore the height will be used.

Fauzi recalled a common scene where a *tukang* will host his client and family who will reside in the house he is currently building. This portrays a common Malay culture or *adab* of treating guests as part of their own family, which is also supported by the Islamic views that the Malays uphold. Evidently, accepting an outsider within a *tukang's* family house

³¹⁵ Dr Syed noted on the vocabulary used in both trade - house and boat-building - are the same, similarly of the tools used, however differ in the treatments.

³¹⁶ *Tukang Azih* claimed to understand the concept of mathematics in these segmentations as it is, “linked with the concept of ‘twenty qualities’ of Allah (God),” a concept familiar by the Malays but now forgotten.

³¹⁷ He revealed that some *tukang* had copied the staircase works he had done by tracing the profile of the stairs onto paper in order to create a template for their own projects.

shows that the client may be someone they knew or someone close to them, possibly relatives³¹⁸.



Figure 4.14 The heritage house of Haji Kundur during reconstruction under the supervision of Fauzi. Source: Author, 2015

A *tukang* hosting the client could be possibly for him to understand his client better or simply just a kind gesture, where the Malays are known for their hospitality. This posits that a *tukang* is not only responsible in building houses, but to express the status, proportions, symbolic embellishments and the rituals associated with the house owner. As a result, the heritage house of Haji Kundur³¹⁹ was claimed by Fauzi to have

³¹⁸ It is reported that the Malay culture has several stages of treating and classifying guests reflected in the spaces allocated to them. The unfamiliar guest or stranger is normally served at the lower part of the house near the staircase. The ones that are familiar will be served at a secondary platform (*pangkin*) whilst the person they know well has the privilege to enter the house.

³¹⁹ The heritage house of Haji Kundur was thought to be at least 100 years old, relocated from its original site in Kampung Rendah, Chembong in Rembau, within the state of Negeri Sembilan. It was conserved at Politeknik Port Dickson

carvings and embellishments that impersonate the symbol of a cat³²⁰. Though Fauzi could not justify the reason, he speculates that *tukang* carefully constructed the house not only to accommodate the client's requirements, but possibly to make peace with the spirits that signify the client or that the *tukang* themselves believed in. This demonstrates that *tukang* were not authoritarian towards the house design, but worked hand in hand with the client in order to build a house that is culturally significant for the client. In short, the *tukang* takes a holistic approach to understanding the building culture.

In order to achieve a holistic understanding, Alex advises new generations to acquire knowledge passed down through oral means. This could be done by reading, but then again, "It's a pity we don't have much written (oral knowledge) in clarity," of local Malay house-building culture, he adds. Alex highly praised *tukang* who have both technical know-how as well as knowledge of concepts, such as *Tukang Jamal*. "Ustaz Jamal is the ideal *tukang* [as] he is really interested in the research and related matters." Previously, Alex had commissioned *Tukang Jamal* in some of *Terrapuri's* reconstruction works. Despite *Tukang Jamal's* mastery, at present, skills and knowledge in Malay house-building are vast and cannot be mastered entirely as claimed by Alex: "Although he (*Tukang Jamal*) learnt from *Pak Ku (Adiguru of Malaysian Carving)* as a carver, I do not think he can carve nowadays." This however may be inaccurate as when observed, *Tukang Jamal* maintains his ability to carve and at present, focusing on *Kris* hilt.

The preservation of the knowledge described earlier, requires that it not only be safeguarded but also disseminated and developed. This had occurred over centuries as the technique and built form of Malay houses had evolved due to the knowledge established, practiced and acted out by previous *tukang*. Alex explains the discovery from his current conservation project: "We acquired this house (with *pasak* and *tanggam*)", describing the details found as 'smart'. He concludes that the house had emerged from, "one architecture, transformed into a new architecture, but adopting (Malay) old methods and techniques."

with the help of students and lecturers, while the reconstruction was supervised by Fauzi. The project was partly funded by UNESCO.

³²⁰ In a brief visit to the reconstruction site of the heritage house of *Haji Kundur*, Fauzi claimed to conclude that his thorough observations of carvings throughout the house depicted the appearance of a cat's face.



Figure 4.15 Modern equipment in a tukang workshop, overlooking the Janda Berhias wall panel of Terengganu houses. Source: Author, 2014

“We found *Potong Belanda* and *Limas Bungkus*³²¹ traditional houses (..) employed the *pasak* (wooden dowels) skills. For example, [the amalgamation of] *Potong Belanda* with *Janda Berhias* wall panels (a Malay house wall type), demonstrates that past *tukang* [were capable],” not only in building house but had the skills to adapt, particularly in the use of *tanggam* as these tukang, “didn’t use bolt and nuts but only *pasak*.”

4.4.3.2 Building Skills

Malay knowledge and traditional skills are both related and relevant in continuing the Malay building trade. Haji Yusof argues: “Knowledge is expanding as [Malay] culture is dynamic,” which is constantly appropriated to facilitate the context it is in. With regard to this, he

³²¹ *Potong Belanda* and *Limas Bungkus* are local house styles influenced by colonization, but adopting the *tanggam* details from traditional houses.

points out that there must be a requirement of, “techniques and methods,” in applying them. Hence, the values of Malay craftsmanship in building traditional Malay houses should also evolve whilst the techniques and its application changes through time.

Typically, the skills of Malay *tukang* are inherited from the forefathers and this goes without saying that, “they (Malay house builders) are skilled *tukang*, [and as a consequence] they build (houses)” explained Alex. The skills according to Fauzi are, “inherited automatically, it is not forced, as what the father does, [the offspring] have to continue doing.” He relates to the proverb ‘*kais pagi makan pagi, kais petang makan petang*’, expressing the plight of the peasant that needs to work all the time. “In order to live, [the young *tukang* or apprentices] have to help their father build houses,” and eventually, Fauzi adds, “They’ll learn the skills [of building houses].”

In addition to the influence of the family, the community also played a part. Dr. Muhammad recalled his past experience in his *kampung* where, “Transportation is [using] *sampan*³²², [therefore] everyone knows how to do (build) a *sampan*.” Hence it has become a common trade within that small village as, “naturally, [the people] are meant to learn,” he concludes. Dr. Muhammad was convinced that such a phenomenon is due to the context of the *kampung* that lacks formality³²³, which advocates the natural manifestation in the way people learn and accept their fate (*rezeki*).

A peculiar method in identifying a tangibly-skilled *tukang* is from the pattern of the *pantat siput* (snail’s rump) on the thumbprint. On the author’s preliminary visit to his workshop, *Tukang* Jamal introduced this concept, believed by past people. He claimed that the pattern, when evident on one’s thumbprint, demonstrates his credibility in ‘making’. Likewise, *Tukang* Azih defined this as evidence of, “someone’s intelligence,” as explained: “If he learns, [it is] easy for him to understand, but without it (*pantat siput*), he is slow-witted.” Though unproven, the abundance of formula for what the Malays called *petua* (tip or prescription), is significant in the world of Malay craftsmanship.

³²² A small watercraft or boat of Malay type, made of wood.

³²³ Dr. Muhammad defines the casual settings to the extent where, “people don’t make appointments,” for them to learn from a master or anyone.

Alex explained: “Each *tukang* has a different *petua*,” and this explains the diverse understanding of symbolic meanings among the *tukang*.

Subsequently, discrepancies in understanding led to diverse practices in the built techniques of Malay house-building, where Alex described his findings: “We could see how [intricate] the details were [in] those days, even [when] *ketam* (jack plane tool) [was used]; the surface is so flat, [while] in some houses they are not.” Therefore he assumed that, “we could see the difference of *tukang*,” in terms of skills, as a consequence of the “discipline of [each] *tukang*.” Nonetheless, it is a perfect example of skills depicted in an artefact such as a traditional Malay house. In the same way, conservators such as Alex could speculate on intangible characteristics and qualities derived from tangible objects.

The development in skills is important for *tukang* as they are continuously improving their ability. *Tukang* who build Malay houses - defined as ‘rough’ or ‘large’ category of craft by Tukang Jamal - usually challenged themselves toward better quality in making and sometimes pursuing a more intricate craft such as carving³²⁴. Meanwhile, Tukang Jamal encourages anyone attempting to develop and adopt contemporary elements (ie. digital 3D computer production) within the traditional trade, “To understand technique in (Malay) building craft,” which requires initial understanding of the construction of Malay structures. Knowing and understanding alone is not sufficient; also essential is a means of analysing the building systems.

Tukang Azih underlines the importance of sight as a means to understand techniques. Sight motivates the “sensory feelings,” while the “heart and brain have to be quick (in the actions).” Furthermore Tukang Azih relates the benefit of sight given by God to understand this traditional trade: “God gave us vision (sight), [therefore] we could be what we wanted to be³²⁵.” In relation to visual perceptions where according to Dr. Fawaz, a great *tukang* could be identified by their masterpieces and subsequently, “anyone deep in this knowledge, [will]



Figure 4.16 Existing markings carved into an abandoned building parts. Source: Author, 2014

³²⁴ Dr. Fawaz noticed the attitude in some of the master *tukang* (ie. Latiff Long, Nik Rashiddin, Norhaiza, Saha Tajung Sik and a few others) to evolve, challenge and push their limits in producing crafts and masterpieces.

³²⁵ Again, this resonates with the concept of skills influenced by the eyes and brains that reverts back to the notion of a higher authority in religion. Likewise, Tukang Azih somehow relates his knowledge on past techniques and concepts on the qualities of Malay boat-making he acquired.

acknowledge,” and could recognize the ‘character’ and ‘styles’ of its maker³²⁶.

Tukang Azih also made an effort on-site to demonstrate the application of *dammar*³²⁷ and teak wood used during the author’s visit at the conservation site of Losong Haji Su. His explanation included tactile actions in identifying the elements of colour, smell and textures. These actions include detailed observation of colour or a particular character, smelling the material surface, knocking on the wood to listen for the right tone and breaking or chipping part of the material to explore its composition, which is part of common woodworking practice. The author finds it interesting that all *tukang* when describing the scale of a subject, use part of their own body to compare and explain their proportions. In the same way, past Malay *tukang* have been adopting the Malay measurement systems that use part of the hands and body as a unit in expressing dimensions³²⁸. Unfortunately, at present, most traditional builders rely heavily on modern measurement tools.

Although the Malay measurement system was important and generally accepted within the building culture, it is a challenge for *tukang*. Alex offered his opinion: “I think the most (difficult and important) thing is measurement,” for *tukang* to acquire the skills in ratifying the height of house where, “if [*tukang*] calculate measurements wrongly, it will create problems.” This is because “the joint requires a proper measurement,” if the construction is to avoid waste and to achieve perfect assembly, adds Alex. Because of the availability of timber as a renewable resource, it was used as the main building material in Malaysia, although prone to mistaken cuts. Tukang Azih reported that there is a common rule to how many mistakes can be made before the wood had to be discarded or used elsewhere. He proposed: “Only two times (mistakes) for measurement and cutting, while three will make it unattractive.” It was described as, “short and ill-judged measurement.”

³²⁶ Dr. Fawaz defined *tukang* to have similar traits as artists. Hence, as an artist, one could identify and single out the masterpieces of others.

³²⁷ *Dammar* is a Malay term to describe a vegetal resin or gum tapped from certain plants (Malays called it *dammar* trees). When heated or mixed with other substances create other applications. Past centuries has seen *dammar* as a trading material, thus playing an economic role in Southeast Asia especially in its applications or maritime industry such as boat-building.

³²⁸ For detailed explanation, refer section 2.3.2.

The emphasis on measurement skills prompted the question of the tools used for measurement. According to Alex, a chisel has a major role in Malay house-building in terms of its technical and mythical purposes. With regard to the measuring system, the markings of building components for assembly was commonly made by chisel marks rather than a chalk mark. Alex explained that chalk “disappears later and the numbering [will] fade,” therefore it was only used at an earlier stage. In contrast, a permanent marking made is, “due to what a chisel can do” hence the nature and character of these markings. Observations in the fieldwork suggest that markings of chisel on existing and old building components are sometimes unnoticeable. Current use of marker pens however, is acceptable and convenient, and this was used by *Tukang Ahmad* in his work. Nonetheless, “most of the buildings have (markings) but some *tukang* never use them,” Alex adds, adding that some argue the absence of markings distinguishes the skilled *tukang*³²⁹, in contrast to some builders in the western world where inscriptions and sometimes initials were used as personal manifestations.³³⁰

4.4.3.3 Modern *tukang*

The details and brief background of the subjects interviewed, in particular the *tukang*, were mentioned already in Chapter 3. In summary, all of the modern Malay *tukang* interviewed were considered to be good *tukang*, but at least *Tukang Jamal* and *Tukang Azih* fulfilled the three other attributes required for great Malay *tukang*³³¹. Both *Tukang Jamal* and *Azih* have the status of a *ketua adat* or *Imam* but have

³²⁹ It was argued that markings using chisels are normally made by apprentices, while a master *tukang* rarely uses them. Though this seems unusual as there could be at least a hundred components to work with, it could be possible due to the nature of the repetitive prefabricated building system.

³³⁰ Cooper (2002, p. 30) describe these inscriptions phenomenon: “Sixteenth century examples are for the most part in English, written out at length with the names of the builder and some appropriate sentiment in prose or rhyme. Later examples are briefer and more cryptic, often in Latin, and include no more than the builder’s initials. By the eighteenth century inscriptions of any kind on the outside of houses were rare throughout the country. The falling-off of inscriptions is significant, implying a changing attitude to cultural and personal display.”

³³¹ Rahman (1999) describes at least four key attributes of great Malay *tukang*; they must be a good craftsman, a shaman who can please the spirits, an *Imam* or one that can lead a cultural or religious congregation, and finally a skilled carver. Refer 2.3.2

different capabilities, while Tukang Azih has the attributes of a *pawang*, and Tukang Jamal is a carver.

Tukang Ahmad never mentioned his other abilities when asked (probably out of humility) but was quick to describe the attributes and popularity of Tukang Jamal as an Islamic preacher in his region and also his skills as a carver. Taught by the late master carver, Ku Ismail, Tukang Jamal is also an Imam with extensive knowledge in Islam: his sermons in local mosques have sometimes been recorded and uploaded onto social media. Thus, the possession of deep Islamic knowledge resonates with Malay culture and is naturally associated with the act of building the Malay house. As the Islamic faith took over the animistic, Buddhist and Hindu elements in the traditional building process, the Malays interviewed for this study predominantly included readings from the Holy Scriptures of The Quran while repeatedly mentioning God's and His Messenger's name.

In contrast, Tukang Azih led a group that practices martial arts based on the Malay art of self-defence and also claimed to have the ability of a *bomoh* (another word for a *pawang*) in healing people based on alternative medical practices, while emphasising that he only uses methods approved in Islam. Similarly, he took advantage of this Islamic knowledge as a *tukang*, specifically when some of the traditional buildings were thought to have bad spirits that requires a religious individual to 'calm' them beforehand.



Figure 4.17 Tukang and their relationship according to the attributes describe by Abdul Rahman. Source: Author, 2014

In contemporary practice, the measurement and estimation of timbers to purchase or use for a particular project was discussed by Tukang Jamal and Tukang Ahmad, while Tukang Azih achieved this individually. In each case, the wood ordered was normally perfect in terms of length and amount. This indicates proficiency of *tukang* in the skills of preliminary arrangements to estimate timber lengths and sizes. Secondly, as a prefabricated building system, the Malay building culture could be seen as easy to codify in terms of the component requirements due to the regularity of the prefabricated system. Thirdly, as with other traditional houses, they adhere to the concept of sustainability, avoiding waste and respecting natural resources. Finally, the workmanship expected of a master requires zero tolerance of human error, unless the scheme is easy to build without mistakes. This goes back to the management system used by *tukang* where one will measure, one will do the cutting and the other make *tenon* holes in a sequential process demonstrating that the system is basically efficient.

Though existing and salvaged timbers from old houses could be utilised for new projects, at present, new timbers are sourced directly from the forest and custom-cut in sawmills. This according to Tukang Jamal was economical while achieving the required size, as off-the-shelves timber could not meet the traditional requirement. General measurement of contemporary timber is based on modern building standards, therefore are standardized and not based on traditional measurement. The timbers used in past assembly of Malay houses are larger, wider and longer than normal due to structural requirements of the *tanggam* structural system.

4.5 Malay Apprenticeships

As discussed earlier, apprenticeship way of passing of knowledge and trade speciality is an important aspect in the Malay building culture and akin to the hierarchy of labour within a traditional trade worldwide described by Sennett (2009). Dr. Fawaz highlighted an important element in Malay apprenticeship as the requirement of having *adab*

(punctiliousness)³³². *Adab* becomes the, “order and discipline,” within this building culture and without it *tukang* becomes *biadap*³³³.

4.5.1 Traditions of apprenticeship

This section is based on the experience of *tukang* as ‘apprentices’ or workers. Though it is impractical to recall the authentic traditions of past Malay *tukang*, there is a resemblance of what occurred in the narratives of these *tukang* or from the experience of others, derived from their views, anecdotal evidences and oral transmissions gained from older generations. This is specifically relevant in addition to the literature and the hypotheses of scholars.

Dr. Fawaz emphasized that *tukang* with a *guru*, “Ends up being a master *guru* [himself],” which is normally based on ‘heredity’ within the family lineage of trade. These formal *tukang*, according to him, attended schools he termed as, “*Sekolah pondok tukang* (craft cottage school) (...) [where] the concept is *duduk mengadap* (sit and face the *guru* directly),” sharing a similar concept to the western ‘sitting-in’ (Snell, 1996). It is common in these ‘schools’ to, “provide accommodation [and] food.” However, this is in contrast to the situation of *Tukang Jamal*, *Tukang Azih*, *Tukang Ahmad* and *Fauzi*.

The apprenticeships of *Tukang Jamal* in wood carvings with *Ku Ismail Tengku Wok* for example is comparable to this ‘concept’ albeit rather small. *Ku Ismail*, a *tukang ukir* (master carver), had neither school nor academy but ‘students’ came to him to learn the trade, as in *Tukang Jamal* who attended to him for nearly three years. Avoiding the word ‘apprenticeships’, *Tukang Jamal* claimed to have ‘worked’ with him. He recalled his experience as, “Looking at ways others work and learning other people’s skills.” Similarly, Dr. Fawaz ‘studied’ with the late *Nik Rashiddin*, in which his occasional, “visits and meetings with the master, listening and recording the craft knowledge given,” were meant only to,

³³² *Adab* could be said of having strict observance of etiquette or customs, grace and courteous in behaviour. Dr Fawaz relates the concept of *adab* not only towards the master, but “God, environment and wood.”

³³³ The affect of which could define the *tukang* as *jahil* (ignorant with a religious tone). Here the word *adab* when combined with ‘bi’ (concept of ‘two’) becomes *biadap*; “When I (master) speak, you listen. If you speak I listen. If both speak, who will listen? [A] very basic [concept].”

“obtain information,” or research. However, in later years the interactions were then realised as a genuine form of apprenticeship. “It is an unconscious process, where I identified it as *berguru* (translated as ‘learning with’ or apprenticeship) afterwards.”



Figure 4.18 *Tukang Jamal with his young apprentice installing the timber component in the assembly of a roof structure prior to construction on-site.*
Source: Author, 2014

Meanwhile, *Tukang Ahmad*’s notion of learning the trade is not within the apprenticeship framework as claimed: “In the past, people just follow (blindly)”. According to Alex, Dr. Fawaz and Dr. Muhammad, normally apprentices come from within the family; hence they are sometimes coerced into this trade. A *tukang* could see and ‘read’ in their offspring “[the craft] potential during childhood,” explained Dr. Fawaz. In reference to Nik Rashiddin he said that a *tukang* is capable of “looking at people and studying their ways and behaviour,” before choosing the kinds of knowledge to be passed down³³⁴.

Nevertheless, the ‘working’ process also encouraged curiosity and eventually led to questions. “I asked earlier *tukang*, why these were called *undang*, *gulung*, *tepuh kasau* etc. (terminology in traditional building components) (..) generally [I received] very straightforward answers most of the time,” explained *Tukang Ahmad*. This could be argued to suggest that past *tukang* knew every detail of the house at the

³³⁴ Refer for similar notion described in section 4.5.1.

back of their mind, and also that the Malay house and its concepts were uncomplicated and effortless for people to grasp.

Besides direct encounters with earlier *tukang*, *Tukang Ahmad* described his previous experience with some restoration projects that involved visiting other traditional Malay houses for inspiration, including the ones in Thailand. “We build nine houses for Ku Ismail³³⁵, it took us a long time as two to three weeks were filled with visiting old houses, then back to work,” he explained. This proves that a significant time is taken to ‘learn’ from the available ‘masterpieces’³³⁶ already existed that were built by previous masters. Ku Ismail’s advice to the young and himself: “it’s not a waste [of time and energy] to make old houses.” This is true to the extent that the house itself not only provides a physical cultural heritage but proof in the legacy of civilization, especially in the culture, local wisdom and skills.

In the past, according to *Tukang Ahmad*, “[Building] a house required one to two people, (..) now seven or eight” are required. Comparing his interviews with those of other *tukang* in the 90s, Alex claimed the distinction: “[*Tukang*] put [their] hearts and soul,” into their masterpieces. However, it is also known that in the past village folks played a part in the building of the Malay house, thus less work was required on the part of each individual.

An interesting culture that promotes cooperative work was highlighted by *Tukang Ahmad* when he recalled hearsay from his building experience, in particular the disassembly and assembly: “I once asked the old people, (saying) they lift the major part of the roof in one go,” while the roof structures were “assembled on the ground by one or two people,” and, “everyone that came to help brought along food, hooked on the structure, using *tukat* (timber support) to hoist to the top (..) together they lifted [the roof structure] after erecting the columns.” Eventually, the food is enjoyed on the roof together as a symbol of success and cooperation after the major structures are in place. This could potentially be part of the apprenticeship process, in perpetuity for the Malay generations within the villages, which lack the ‘formal’ woodwork education or training.

³³⁵ A *Songket* (traditional fabric, famous in Terengganu) maker and trader.

³³⁶ ‘Masterpieces’ is a term describe by Dr Syed not only to portray smaller crafts but the traditional Malay houses that are still standing.

4.5.2 Current Phenomenon

Dr. Jaki, a registered conservator, summarized changes in work culture: ‘Today *tukang* exist in multiple entities such as a contractor, wood-based construction factory owner, furniture maker, carver, and others.’³³⁷ In addition, with regard to his current conservation project, modern requirements exist to accommodate local rules and regulations that never existed prior to the modernization of Malaysia.

‘In actual fact, the *tukang* is currently extinct. This generation has been lost,’ claimed *Tukang* Jamal. He claimed: ‘The generation that we have now is from the [era] of the *Limas Belanda* house (of Dutch styles), from year 1918 or 1919. Like my *Toki* (grandfather), his house was built in this style, therefore the *tukang* (current generation) were from 1918.’ This statement suggests that present *tukang* in Terengganu were born out of this new style.

Similarly, Dr. Muhammad argues the necessity to have a ‘master’ within the Malay building culture at present: ‘If we have a master, what can they show? Theories? But if taking part in disassembly and assembly, we also have to understand it. It is hands on (learning experience) and gives them (*tukang*) [practical] exposures.’

In regard to being a *tukang*, *Tukang* Jamal clarified: ‘There is no ideal guideline to becoming an apprentice and later a master *tukang*, other than the will to do so.’ He further highlighted the term, ‘*memandai*’³³⁸ and (sooner becomes) gifted,’ that is purely the urge to develop oneself - in terms of skills and creativity - for new apprentices to act upon. This was probably based on his experience as a contemporary *tukang*; however, this was understood differently by past *tukang*, who had the eye and hand for nothing other than perfection and satisfaction. Correspondingly, *Tukang* Azih’s concept is mostly straightforward: ‘Don’t mince it, don’t act clever (though foolish). To learn, [a *tukang*] have to ask or make requests (from experts or masters).’

³³⁷ Kampung Teluk Memali Mosque Conservation project in Ipoh, Perak, Malaysia; Refer letter of recommendation from the author and supervisors to the architect, conservator and others in Appendices.

³³⁸ *Memandai* could be termed as the attitude of being presumptuous.

When asked how to teach, *Tukang* Jamal simply replied: “Though earlier *tukang* did not have formal academies, fine arts etc., they learned from the environment. These are considered symbolic.” Embellishments of a house presented through an abstract form of certain plants (ie. *ketumbit* and *sesayap* plant) or Hindu goddess (in carvings) could portray the “identity or features that we understood,” even though “in a symbolic form rather than a direct translation” of the thing itself. This implies that apprentices must have a basic understanding of past culture, and the way meanings developed through symbols and form is also crucial to understanding.

This is why according to Alex: “We need to polish them with all these things (symbolism and meaning),” in order for current apprentices to be ‘artistic,’ and to produce masterpieces that contains ‘value.’ Alex himself “Feeds them (*tukang*) now [with information],”³³⁹ and, “corrects [inaccuracy],” accordingly as he claimed that some, “artistic terms³⁴⁰ are gradually forgotten, therefore we try to supplement them.” Alex suspects that current apprentices were inspired from their childhood experience with the Malay house although they never made one. While Alex is not a *tukang*, he claimed to have learned much about the culture with the help of artefacts that he had acquired.³⁴¹

Correspondingly, understanding also extends towards the technique in *tanggam* as *Tukang* Jamal explained: “[*Tukang*] have to look at the connections, how and where are their orientations, for example, a column has different connections (than other components).” *Tukang* Jamal highlighted the difficulty in recognizing *tanggam* connections as they are mostly hidden from view, a characteristic that also describes the use of tenon and mortise joints: “It looks simple, but inside (hidden) consists of this (referring to complexity and intricateness).” This is paired

³³⁹ Alex described the knowledge thought to be pertinent towards ‘proportions’, the type of house styles; ‘*bujang berserambi*, *limas*, *potong Belanda*’, number of columns and terms such as *kuda*, *tulang rabung* etc. This information is related to non-visual cues, or information that could be missed from artefacts.

³⁴⁰ Artistic terms are precise words that are used to describe the terminology of building components, the process, techniques within the Malay building culture.

³⁴¹ Alex mentions of the available artefacts found during his conservation works, apart from the house, his collections include smaller objects such as *kukur kelapa* or *kapitan santan* where these items portray examples of *Makara* or *buah buton* shapes ingrained in past beliefs and sacred ideas.

with the difficult issues in various terminology used by various *tukang* from different regions.

From the fieldwork, the author had recognized types of apprentices that exist within the Malay building culture according to the subjects interviewed and observed:

- i. *Tukang* Jamal described a person by the name of Harun to be “Clever but still eager to learn. He is more inclined towards making things (physically), even continuing at home after work,” which expresses a hardworking individual focusing to develop his skills and techniques further.
- ii. “There are some who are more passionate than their talent,” and, “this exhausted me,” recalls *Tukang* Jamal. “When he has passion, he imagines peculiar things (additional or unnecessary) he wanted to make (or build).” He continues: “When we see things as acceptable, he wanted to do better: more perfectionist, [but] less able,” hence creating unnecessary redundancy (in terms of time and availability of materials). The author assumes that modern requirements such as deadlines and economical factors were advocated by contemporary *tukang* although perfection is still sought-after. Furthermore, redundant or unnecessary additions to the work (ie. embellishments) are against the principle of Malay craftsmanship that has meanings associated with every detail.
- iii. Some apprentices are capable of building Malay structures, and are approved by the masters, but hesitate to act as a ‘leader’ and take responsibility. This was mentioned by *Tukang* Azih: “Sani (his brother), he could do (build houses himself), but houses are large [therefore] he is not confident.” According to *Tukang* Azih, “before cutting, he (Sani) will first seek advice (from him),” hence the aspect of self-assurance is lacking. Self-assurance is essential for mastery of a prefabricated building technique that requires minimal error in its initial development.
- iv. In contrast to Sani, some of the work on-site is not for apprentices or workers to build themselves. “I don’t let people (apprentices) do staircases,” *Tukang* Azih explained, “I have to do the settings (measurements) myself,” which is to be expected in the role of masters to prepare dimensions. He adds: “Rather, I asked them to do the cuttings, then we align it,”



Figure 4.19 A wakaf structure of Terengganu style at Terrapuri. Source: Author, 2015

- portraying the level of apprentices within a hierarchy and the level of trust given to some as they are not proficient enough for such highly demanding skillsets.
- v. Other apprentices “Only want to work but rarely think of becoming a great *tukang* themselves. Works for weekly salary and does only what they are told to,” explained *Tukang* Jamal, who sees this type of apprentice as unlikely to become a future *tukang*. *Tukang* Azih described a similar attitude; “If studying, [they don’t] pay attention, [nor] remember things [and do not] listen to words. (They are) not focused.”
 - vi. *Tukang* Jamal’s account points to another type of apprentice, which he respects: “A new worker (..) but quick to learn,” and in terms of attitude, “wanted to do things, hardworking, seeing it as a challenge” and “giving commitment, sometimes working till night.” *Tukang* Jamal defined; “He worked like *kerja babi* (pig work),” a metaphor for working incredibly hard. Nonetheless this commitment to work has some drawbacks: “when asked to do a complex ‘thing’, he becomes confused [or incapable].” As a result, “if the work lacks a predicted outcome, he couldn’t do it,” as he worked in phases and, “wanting to see everything (each building component) completed [progressively] one by one.”

While the above is limited and non-exhaustive, *Tukang* Jamal highlighted that, “there are various people (attitudes),” to deal with and therefore, “we have to understand these ‘workers’ [and treat them] similar to your offspring.” Similarly, *Tukang* Ahmad expressed the need for ‘experiences’ in observing the apprentices based on their individual capabilities, especially in the measuring of components.³⁴²

During the fieldwork, whilst *Tukang* Azih was seen to be in a supervisory position, *Tukang* Jamal and *Tukang* Ahmad were involved directly in the process of making. Both were actively engaged with machines in cutting timbers and making mortise and tenon holes probably due to the

³⁴² *Tukang* relies on experience and cannot explain the aspect of the learning curve. However interestingly, *Tukang* Ahmad emphasized on observing measurements made by apprentices and the process of teaching typical measurements such as for the *kekuda* (framed roof trusses). Understanding the aspect measurements can be daunting and valuable for an apprentices or labourer to increase or attain their status as a *tukang*.

different nature and scale of the project for which they were currently commissioned, compared to *Tukang Azih*. As of that moment, *Tukang Ahmad*'s active involvement was necessary as the *wakaf*: the building adopted a unique and uncommon technique and thus required constant intervention in the apprentice works.

The task of staying at site is also limited where currently the use of machines makes the work even faster, however, while on-site in Serdang, it was observed that hand tools were used to cut timber. In addition, the timbers had already been prepared in the workshop earlier, where the hard labour of cutting big chunks of wood as well as sanding and *ketam* (the action of using a jack plane or similar machines) works are prepared. It can be seen that all of the *tukang* played their part in contributing to the work on-site as well as guiding the apprentices and workers with the knowledge they have.

4.5.3 Multiplications of *tukang*

The building culture at present not only relies on traditional *wakaf* to survive, but according to *Tukang Jamal*, thankfully has demands for interior and furniture activity. As observed, though the furniture adopted the style of *tanggam* connections, they lack the qualities of comprehensive indigenous techniques, skills and knowledge of a whole 'system' in house-building. Therefore current work demands provide limited opportunities for the continuation of heritage skills.

Alex mentioned the aspect of *tukang* and their groups where the Terrapuri conservation project started with at least 5 groups of *tukang* working to rebuild traditional houses. The hierarchy of work was common: there is a master *tukang*, his assistant or apprentices and workers. Eventually, the apprentices gained sufficient knowledge and confidence to part ways and become a master craftsman themselves. Now Terengganu has at least 10 or more groups of *tukang* operating although previously, it was "very difficult to find any, almost none, probably only one or two," claimed Alex.

In regard to the above, *Tukang Azih* and his brothers were boat-builders or labourers in modern construction before they become *tukang* in building traditional houses. Before becoming involved in Terrapuri, they were never apprentices to a master but are similarly proficient in the

traditional trade. For example, the author sighted the ability to specify building component quantities and sizes, making interlocking mortise joints and understand the strict procedural process required. This includes the skills implicit in marking and identifying each building component to correspond with the disassembly and assembly system used in the past. Here, *Tukang Azih* and his brothers were thought to have learnt the bulk of their accomplishments from the Terrapuri project, because of direct engagement with the old traditional houses.

That said, specific skillsets are needed in order to increase the number of *tukang* on this project. It is claimed that a *tukang* must first understand how to use the chisel, an important tool used in making dowels and marking timbers for disassembly and assembly. The initial building process was reported to start with identifying the proportions of the house, from the perspective of rituals to find appropriate scales and cultural inclinations as well as from structural and spatial requirements for technical understanding of load and span. Apart from traditional tools used³⁴³ modern *tukang* adopted the use of machines, which were also a crucial skillset for current apprentices and *tukang*.

4.6 Loss of knowledge

The loss of knowledge is considered the main reason to the loss of skills within Malay house-building culture. In this section, the losses of knowledge and skills are considered parallel with the problems that arose within the building trade as well as Malay culture, specifically in relation to the practice of *tukang*. The author had identified three main categories of the problems, leading to the loss of knowledge: Malay cultural reasons; traditional building practices in conjunction with forms, tools and rituals; and finally, regarding conservation practices and policies undertaken as suggested from the fieldwork outcome.

4.6.1 Malays and their culture

According to Alex, the oral tradition within the Malay house-building culture was responsible for the diminishing trade.

³⁴³ For examples of traditional tools used, refer section 2.3.2.

Alex claims:

“The problem with people like Wan Su, Pak Ku, [and] many more earlier tukang, they transferred knowledge to their offspring in oral and not written form - that [created] the problem. Slowly one generation to the other, [they] received only 70%. Like Wan Po to his son, I think he (son) is getting 50% from the real skills [and] the real story, gradually.”

Alex optimistically concluded that although traditional knowledge and skills are difficult to preserve, “we have to get them right and back (active) again.”

The above may be a common worldwide occurrence but even in written Malay artefacts, there is insufficient information as well as the absence of critical research on *tukang* according to the author’s experience.

The oral tradition is further diminished with the stance of some Malay culture in sharing knowledge, mainly related to ‘healing’ practices. *Tukang Azih* explained: “[If] nobody asks [or requests] (..) [I] will not inform [anyone] of any knowledge,” which applies within the building culture or even within an emergency situation.³⁴⁴ Peculiar as it may seem, the author noted a similar occurrence within the alternative religious medical and traditional healing customs, practiced by Malays.

Although the condition may not be similar (such as in Islam it is compulsory to help people in any circumstances), the practitioners competent in treating the sick claimed to refrain from allowing to reveal their abilities unless they were asked to do so. Hence there may be questions of principle or *petua* (tip or prescription) in traditional practice abided by Malays or just simply being very humble,³⁴⁵ as portrayed in the old Malay proverb: ‘*resmi padi, makin berisi makin menunduk*’³⁴⁶.

³⁴⁴ *Tukang Azih* explained: “Even if somebody’s dying, [I] will not do it (help). Somebody has to ask me to do it.”

³⁴⁵ It was mentioned that *Ayahanda Latiff Long*, a master *tukang*, declined to accept ‘*Datuk*’-ship (formal honorific title in Malaysia) as, “he prefers to be low profile,” reported Dr. Fawaz.

³⁴⁶ The ‘*resmi padi, makin berisi makin menunduk*’ is literally translated as to follow ‘the attitude of paddy (In rice as a staple food for the Malays), the plump it gets, the more lowly it reaches (As in being humble and modest).’ In modern psychology this phenomenon could be in contrast to the Dunning–Kruger effect,



Figure 4.20 Fishing boats made out of wood and employing pasak.
Source: Author, 2014

However, it appeared that humbleness is part of the cultural reasons that includes the behaviour or what Haji Yusof described as a ‘Malay attitude problem’ within the community.³⁴⁷

Conversely, being humble may not be an appropriate justification, however it lies in the culture of that particular period. Dr. Muhammad addresses the outlook in the past, where people who built *sampan*²⁰³ in those days were, “taken for granted, although timber *sampan* are more stable than the [current ones made using] fibreglass.” He continues: “During that time, people view the *sampan* [as a typical and mundane object],” not a specialized craft of its own, although, “my grandfather knows how to build a *sampan*, the only person. However, nobody calls him a master or *Adiguru*³⁴⁸,” a current title recognizing craft excellence.³⁴⁹

As a master or a *guru*, the Malays were usually selective in transmitting their knowledge, which suggests strict and careful considerations in undertaking. “Nobody could go (learn) from a *guru*,” or has similar ‘conducts’ in communication as the transmission will not be the same, explained Dr. Fawaz. In his case, the master, Nik Rashiddin, “transmitted to me (Dr. Fawaz), knowledge that he didn’t tell the others (..) [where] some of the things were [specifically] meant for me.” Since Dr. Fawaz is an academician and not a *tukang*, Nik Rashiddin informed him of what is

where people of low-ability (ie. skills and knowledge) has a bias into thinking that their superiority is greater than of people with credibility.

³⁴⁷ Humbleness was claimed to affect the decline of Malay house-building culture. Experienced by Haji Yusof, his grandfather was a person well known to have the ability to perform *silat* (art of self-defence) on top of small *perahu* (timber boats) where other people acknowledged his ability, hence was highly respected. However, “when asked by the grandson (himself), he (grandfather) humbly states the opposite,” Haji Yusof adds.

³⁴⁸ *Adiguru* is someone who was given the honour and recognition by the Government of Malaysia as a craft leader or master craftsmen, however must meet certain criteria. Refer: <http://www.kraftangan.gov.my/maklumat-kraf-2/tokoh-kraf/adiguru/>

³⁴⁹ As a criticism, these titles and recognition according to Dr. Muhammad is only due to, “current system (..) because [currently] we could not find great individuals, therefore was chosen based on that (limited) criteria.” At present, “even the apprentices can easily seek for *Adiguru* title because of the lack of skillful [crafts] people,” he claimed.

best suited for his role, mostly related to myth, conceptual and immaterial ideas.³⁵⁰

Furthermore, there is a lack in enthusiasm from young people and new apprentices that led to a generation gap. In his observation, Dr. Fawaz³⁵¹ and Dr. Muhammad lament the circumstance of young generations from a family of *tukang* who envisage a different path to their careers in life. Dr. Muhammad explained:

“[Within] Perak, Negeri Sembilan and Pahang states, all [I see] are new tukang (or apprentices), young people. There are no similarities. Sometimes, we couldn’t see the continuation from the old timber tukang. There is a gap. In my place, Negeri Sembilan, a timber tukang, [his] son or grandson doesn’t continue working in building (traditional houses).”³⁵²

In contrast, *Tukang Azih* described the attitude of young apprentices that were not fascinated with the trade. “Young people are not interested,” he said, and as a result within the trade, “no (new) generations or inheritors,” among the young. This was also due to the master *tukang* being unknown to most when Dr. Fawaz described: “Guru that is ‘authentic’ (..) he does not stand out.” While that is the case, young people, “lack confidence; [thus] constantly asking (what and how to do),” adds Fauzi. In this regards, there is also a conflict among the old and young within Asian societies. In a Malay culture, “young people could not ask old people a lot of questions. When asked a lot of questions, this [led to] a kick in the mouth (as part of a metaphor to decline),” asserted Haji Yusof. Therefore, the young apprentices could

³⁵⁰ Dr. Fawaz claimed he was made, “A representative (..) in the academic [world],” by Nik Rashiddin and that knowledge was, “from the perspective [and capability] of an academician.” For further reading on Nik Rashiddin, refer Noor, F.A., Khoo, E., 2012. *Spirit of Wood: The Art of Malay Woodcarving*. Tuttle Publishing.

³⁵¹ Some offspring from great master *tukang* such as Nik Rashidin, Norhaiza or Ayahanda Latiff Long were observed not to follow their father’s footsteps. (Exception is given for Latiff Long’s offspring with his second wife who could be considered as a *tukang*).

³⁵² It is interesting when Dr. Muhammad mentioned that even a master *tukang* themselves had to stop working due to conditions generally related to age, health as well as economy. Hence Dr. Fawaz mentioned the need for somebody else, not within the family lineage to take over the craft.

only follow in the actions of their master due to the limited opportunity to have a thoughtful discussion or argument.

It is unfortunate to see the young or new apprentices looking up towards a career in the traditional crafts but in the end perish to the reality and pressures within their own surrounding³⁵³. As a result, the young generation or new apprentice, “Doesn’t have a direction, [and due to lack of] *guru*, he is on his own,” hence Dr. Fawaz’s explained his role as an academic who also understands the practical side of craftsmanship: “To make sure [they] are not manipulated³⁵⁴ (..) [and] making sure he (new *tukang* or *apprentice*) does the right thing.”

Equally important to add is the manner of some Malay practitioners who limit the knowledge towards themselves or inside the family in order to remain within a controlled trade. Haji Yusof explained: “We (Malays) are stingy in sharing knowledge among ourselves. Like a shaman, they are afraid that their skills will be given to others and therefore will reduce their incomes.” Although this sentiment may not be general, it provides some insight into some of the possible reasons knowledge is lost, coupled with both reasons of interest in young people within the trade as well as their disputes with older individuals. And yet, Alex disagrees with the closed-door culture and thus advocates the need to pass on knowledge in order to create more *tukang* in the process. “We cannot have one hero, so we need to acknowledge all *tukang* [or apprentices] as heroes,” he emphasized.

4.6.2 Development in Practice

Meanwhile in the building practices of traditional *tukang*, there are modifications in the rituals and actions involved. There is an apparent

³⁵³ In between the months of the first and second fieldwork research, the author observed at least two of the young or possibly called modern apprentices, turned back from their initial passion of preserving the legacies of the Malay crafts which happened to be of their own forefathers. One had migrated to a slightly urbanized town of Seremban for a steward career, while the other had followed his relatives to fish in the deep sea. While the latter means of living was at least said to represent the impression of a Malay peasant in the past, both new apprentices were a great loss and has become a common recurrence for offspring of Malay *tukang*.

³⁵⁴ Manipulated here means not to be influenced or indoctrinated by unauthentic Malay craftsmanship.

withdrawal of rituals in current practices mainly due to religion, element of *syirik*³⁵⁵ and modern technology. However, Alex justified that the main reason was due to *syirik* therefore, “they (*tukang*) come out with new terms (to replace the ritual).” Alex further explained: “That’s the problem, because we could not know the root (of the ritual)³⁵⁶,” and as a result the origin of the rituals are forgotten but more importantly, “they (rituals) couldn’t tell the story anymore.” While rituals evolve, the root of the practices (even the form factor) could not be traced thus preventing it from being understood by later generations.

Similarly, before the existence of sawmills, Dr. Muhammad recalled his experience from his grandfather: “My grandfather in Negeri Sembilan, brought buffalos up to the hills to cut down trees, divide (tree trunks) into eight or six. Shaped (cut the tree) while still fresh in natural resin. If dry [it is] very hard (to shape) (..) as wood is still soft [and] if dry, nails won’t penetrate.” More importantly, what people tend to overlook, is the reason things were done in a particular way. Dr. Muhammad pointed out: “The natural resin acts as a natural defence against termites as it is a natural lacquer.” At present, the way timbers are sought has changed since the sawmills were introduced, hence the concept of ‘one tree one house’³⁵⁷ and the actual column arrangement as well as its orientation according to the trunk has been lost.

Nevertheless, Alex states: “*Tukang*’s knowledge is important, as they are skilled.” He relates: “We have a lot of skilled workers, ‘wood *tukang*’ who can do woodwork. But now, it decreases by the day.” Changes in the building procedure are obvious, “due to the expense of timber (..) there is no demand.” Brick and cement form of linked or multi-storey houses currently replaces stand-alone timber buildings such as traditional Malay houses. Furthermore Alex lamented: “A lot of houses are built using concrete, when describing concrete works, Indonesian workers monopolise [the skilled work],” thus dominating employment and changing the local market for skilled work.

³⁵⁵ *Syirik* or *Shirk* is the sin of practicing polytheism or idolatry, worshiping of anything other than the singular God or Allah.

³⁵⁶ Alex advocated that a ritual must be referred back to its own source hence associating the term ‘tumbuh berpunca’ (grown from source or origin). He claimed that it was in the 1920s that Malay rituals were mostly neglected when *syirik* were involved.

³⁵⁷ See section 2.3.1.

Another case in point is that modern *tukang* tend to deviate from traditional techniques in conservation practices and hence may create misperception between what is tradition and what is not. Alex observes the occurrence: “Normally they (modern *tukang*) tend to deviate from authenticity, because they have their own opinion or maybe he had worked for so long [in] building semi-traditional houses, adopting nails such as (typical) *kampung* houses. He (*tukang*) stops making things artistically.”

In order to find a solution to this, Alex had to provide *tukang* with the theoretical knowledge of how it was done in the past. “We will advise [while] emphasizing [*tukang*] our needs,” he adds. Referring to *Tukang Azih*, Alex described his affair: “I know he (*Tukang Azih*) including his other brothers has good skills. They can do (build), but we have to show them (traditional method).” The reason being is, “because [understanding] proportion and others (ie. traditional building knowledge) are very important,” in contrast to a *tukang*’s understanding of, “only through imagination.” However, unlike others, Alex asserted: “*Tukang Azih*, he listened, so he abides all that was required [and thought].”

This extends towards the knowledge in adopting and supplying traditional materials such as *atap bata*³⁵⁸ and *dammar*³⁵⁹. Although

³⁵⁸ *Atap bata* (clay roof shingles) is a type of roof tile made from clay. According to Alex “we [even] introduced them (*tukang*) [to] *atap bata*, so now if they want to do [future] restoration project (..) we have *atap bata* in Bachok, Kelantan,” available at *tukang*’s requests. Though imitating traditional qualities seems tedious, more importantly, “at least we want to get the things [traditionally and principally] right,” he concludes.

³⁵⁹ Before the use of zinc as roofing material, *dammar* was used as a sealant for timber joints to prevent water seepage, a traditional raw material for waterproofing. *Dammar* was obtained from trees available to the Malays and was used in *Losong Haji Su* house. During fieldwork, *Tukang Azih* demonstrated the use of *dammar* on one of the roof valleys of the house, which will be replaced by modern resins such as fibreglass as a part of the conservation process. *Tukang Azih* revealed the gum material in describing its smooth resin-like texture, burnt smell and dark translucent brownish colour while explaining its use in relation to the maritime application in boat-building. His past experience in making boats contributes toward this knowledge thus providing him with an advantage to the qualities of Malay craftsmanship associated with Malay boat-building. Therefore the saying of, “*tukang* whom builds boats can build houses but a house *tukang* may not be competent in building boats,” is rightly portrayed in this situation.

modern materials are normally advanced or of higher quality, in the case of timber *sampan*²⁰³, they are, “not hard wearing.” This is similarly true of boat-buildings in Terengganu.³⁶⁰ Development of materials or even their unavailability may contribute to the decline in traditional building techniques. However, the reintroduction was for *tukang* to understand the skills as well as the available options to revive traditional techniques. In order to do this, it seems to suggest that the progress of knowledge in skills as well as techniques is currently a priority.

On a different note, and until now, the ‘clients’ or relevant authority were seldom considered part of reason for this unfortunate loss of knowledge within the traditional building trade. According to *Tukang Jamal*, as of now the “clients themselves have been ignorant in the art of craftsmanship,” hinting at the affects towards their acceptance of good craftsmanship. Subsequently he claimed that it is mainly influenced or evolves around their wealth, having, “a lot of money,” rather than seeking quality or its contribution to a greater good. This is why the heritage industry such as in reviving traditional Malay houses, isn’t popular in the recent past due to its low financial gain as identified by Alex: “This thing (heritage), the return of investment (ROI) is not good.”

4.6.3 Conservation issues

Tukang are currently considered as labourers, hence the community of craftsmen involved in building traditional Malay houses are becoming short and lack voices. Alex expressed his opinion: “No one appreciates, because we don’t appreciate them (*tukang*) as artists,” therefore “they are not artists anymore [as] we call them labourers and builders.” It is apparent that they were put into corners and considered insignificant.³⁶¹ The nature of the conservation contract such as within the project of Losong Haji Su amplifies this disparity, where *tukang* were sub-

³⁶⁰ Traditional timber boats throughout the world were built from skeletal to surface enclosure, however is the opposite in Terengganu. The outer enclosure of Malay boats depends on the use of *dammar* as its waterproofing solution. Deep-water Malay fishermen prefer timber boats to modern aluminium boats for their stability in rough seawater conditions.

³⁶¹ As per the limited observation by the author in the conservation project of Losong Haji Su house, *tukang* (*Tukang Azih*) were disregarded in one of the conservation meetings the author attended with consultants and clients.

contractors from the main contractor awarded which happens to be a furniture and wood company.³⁶²

However, *Tukang Jamal* sees himself and others still practicing the traditional trade as an expert and quoted: “I think this is a specialist (people).” Perhaps, he believed that in order to succeed, there must be a way to enhance and bring back their reputation. *Tukang Jamal* suggested introducing something similar to a guild³⁶³ that could overlook the traditional Malay building trade. He felt optimistic about the benefit of such organization as what was already established by contemporary Malay carvers. In the same way, the author identified that the main concern within this traditional trade is the remuneration and its relation to the quality of workmanship, which *Tukang Jamal* said to have been a dispute even among *tukang*, therefore creating tensions and devaluation of their service and craftsmanship. In comparison, workmanship of the past was, “more inclined towards satisfaction,” which is now, “motivated by business³⁶⁴.”

4.6.3.1 *Interests and Work demands*

The lack of interests from young generations described earlier is further escalated by the lack of attention from the current government. With

³⁶² Although a furniture manufacturer, which can be understood to relate with timber as the material of trade, they may have lack values or intent of an authentic conservation process interpreted by the author. A group of *tukang*, under the supervision of *Tukang Azih* and his establishment *Pertukangan Warisan*, was made similar to a sub-contractor for the furniture manufacturer (main-contractor). Some of the components, often the large or laborious ones, are made in the wood factory owned by the main contractor, however, most of the timber works on-site was conducted by *Tukang Azih* and the team. The arrangements were as such possibly due to the requirement for experience in official managerial affairs when dealing with multiple parties (ie. consultants, architects or government officials), similarly of modern construction contracts. Therefore, the small establishment owned by *Tukang Azih* may have lack in these terms.

³⁶³ “We have to create a ‘value’ [by inviting] all of the *tukang* one by one [together],” and, “we should have an advisor and president,” to oversee the trade as described *Tukang Jamal*. The function is analogous to a guild.

³⁶⁴ “When *tukang* is satisfied, the client is satisfied,” however business, “demands faster work rate,” hence could lack quality, claimed *Fauzi*.

past mishaps,³⁶⁵ the government was not seen to be the champion of heritage, leaving it to individual efforts made by some such as Alex and Dr. Muhammad, although both were often criticized for profit-oriented heritage practices. Nonetheless, Dr. Muhammad claimed that, “state governments understand this (decline in heritage), (..) However neglects them.” He saw the potential in governments buying and taking over abandoned Malay houses, “to be kept and stored for use in the future,” due to the, “teak used in traditional houses [that] are first class wood.”

With the declining of new Malay structures and restoration projects, comes the declining of work within the traditional building trade. “There are many craftsmen who still engage with traditional Malay houses like *Tukang Azih*,” and, “similarly *Tukang Jamal* with their experience in traditional restorations.” Therefore the stagnant market for such projects possibly cease the development of craftsmanship among contemporary *tukang*. Conversely, Alex further claimed: “Craftsmen exist [only] if there is still demand.” Demands for building work were always a key for the survival of these ‘specialists’ and without it the craft will eventually disappear along with the tacit and implicit knowledge that it represents. However, according to Alex: “Luckily, there are still restoration projects, although it’s only a process of dismantling (disassembly and assembly), repairing and even only for smaller items.” For that reason, this study attempts to demonstrate the benefits of restoration practice, in relation to disassembly and assembly, despite its limitations.

Continuous work in building new or conserving existing traditional Malay houses benefits the heritage industry as well as the *tukang* themselves. Alex concluded that after the implementation of Terrapuri, the *tukang* could, “charge [their services] double [or] triple,” in comparison to previously. This is because, “now they are expert so that [even] museums, contractors and owners engage them,” but more importantly, “excites new interests from new apprentices,” which is benefiting *tukang* and the building culture, he adds.

³⁶⁵ Recent issues in the safeguarding of Malaysian heritage was the *Lembah Bujang* heritage site in Kedah, where developers bulldozed a site of an ancient Hindu temple or *candi* believed to be more than 1,000 years old.

4.6.3.2 Departure of Skills and Trade

In the author's view, Dr. Muhammad can be considered as a *tukang* though currently he lacks the laborious activities due to his teaching work³⁶⁶. This typical occurrence within the working industry adds to the drawbacks in the decline of involvement of some Malays especially within the lineage of *tukang* such as Dr. Muhammad. Though it is commonly due to monetary reasons, current *tukang* are rarely found, with most having passed away without successors³⁶⁷.

That being said, Dr. Muhammad admits to his shortcomings in hiring and promoting foreign workers for all his conservation projects claiming a lack of local Malay *tukang*. "Available [*tukang*] in my *kampung* (Negeri Sembilan) are Indonesians. This is a problem because what will happen to our *tukang*," he said. This benefits non-local *tukang* and the affects snowballed into other opportunities in similar traditional projects, hence his regret as quoted: "When I hire Indonesians, I'm promoting them." Although his Indonesian workers, "have 7 years experience [and] now experts in Malay houses especially on (traditional) houses of Negeri Sembilan," still, "they are not Malays³⁶⁸ and have no passion and means to preserve the cultural and heritage of Malay." Furthermore, some may find this preservation activity, "not with the intent for [heritage] conservation, but [solely for] relocation," recalled Dr. Syed³⁶⁹. To make

³⁶⁶ Dr. Muhammad explained: "I can do carpentry [while] at the same time I can disassemble and assemble houses," however currently, he manages projects and "acts similar to [the scope of work as an] architect." Dr. Muhammad's profession as a lecturer coupled with his passion as an antiques-collector, prevents him being involved physically with labour intensive work due to time and energy but rather he prefers to manage the projects as a manager and deal with administrative tasks.

³⁶⁷ Similarly, this was experienced by the author when attempting to find and contact *tukang* who continue to practice the traditional trade. Eventually, the findings were made through random visits to *kampung*, word of mouth and recommendations while interviewing.

³⁶⁸ This has been argued extensively where Malaysia, Indonesia and other parts of South East Asia came from the same lineage of culture within the Malay Archipelago. However, Dr. Fawaz emphasizes the needs to define the distinctions available, as now the Indonesians' craftsmanship, "is [getting] better and more intricate." In short, his workers are not considered as local Malaysian *tukang*.

³⁶⁹ Dr. Syed recalled the project of *Penghulu* Dahlan house restored in Pahang, where multiple disassembly and assembly conducted by incapable *tukang*, destroyed the house - especially in the *tanggung* connections. This proves that

things worse, Dr. Muhammad adds, apart from the lack of Malays in the traditional industry, the current, “Malay *tukang* are less competent.”

In the building trade, the current demands for work were normally for *wakaf*³⁷⁰ or traditional gazebo restorations due to the soaring price of timber especially teak³⁷¹. Teak was considered a sought after material to build houses, though some prefer multiple combination³⁷². Nonetheless, there is an issue with certain *wakaf* industry, though, “they create jobs,” there is a significant loss, “in terms of historical value of old houses,” debated Alex. He described the materials used in the traditional *wakaf* or furniture industry were commonly sourced, “from recycled wood,” dismantled from, “old traditional houses,” where, “they cut (salvaged wood) to make timber *wakaf*.” As a result, the quantity of traditional Malay houses which were mostly, “demolished, gone by and missing, (..) could not be built again”.

Though the, “*wakaf* and furniture is beneficial and acceptable, at the end of the day, you don’t have [existing artefacts left],” Alex adds. He expressed his opinion: “[Traditional] houses were supposed to be used in restorations [of houses],” where he claimed that most of the traditional houses could be maintained. Thus this questions the extent of limitation within disassembly and assembly in regards to the conservation process of traditional artefacts. Besides *wakaf*, *Tukang* Jamal describes the current demand for related craft in, “interior such as furniture and embellishments,” hence increases the scarcity of original timbers from traditional Malay structures being built into houses.

the *tukang* lack the knowledge and skills in the procedural method in dismantling *tanggam* joints.

³⁷⁰ *Wakaf* becomes an alternative for the traditional Malay house, for collectors and other enthusiasts to be placed in gardens adjacent to the clients’ modern brick houses. It has become a trend for bungalow owners to own a *wakaf*, as claimed by Alex. The author opined that a *wakaf* lacks structural requirement, smaller in scale and to a lesser degree limited in the technical, rituals and participatory elements of a normal Malay house. This begs the question of whether *wakaf* has similar results in the notion of a comprehensive apprenticeship of a Malay building culture as explained in this study.

³⁷¹ Teak was favoured due to its strength and therefore, *wakaf* becomes a popular mode in replacing the traditional Malay houses as it is smaller, easy to build and less expensive to construct.

³⁷² Fauzi

4.6.3.3 Selective Conservation Practice

Traditional Malay houses owned by a well-known figure or having a special event related to it is usually considered a prominent building with historical values. That being said, previous building preservation undertakings were only interested in Malay structures that provide commercial values as well as its history. This is understandable where such structures were long established as a historical object that linked towards the cultural past, but the question remains of what is at stake for the non-historical houses that are left to rot due to their insignificant contribution in this debate.

In the same way, there is a consciousness amongst contemporary *tukang* in trying to revive and promote the tradition of their crafts. It may seem to be part of a business strategy, but it is at the same time an honest attempt to restore the craft and reintroduce certain aspects within Malay culture that were once admired. For example, *Tukang Jamal* described his actions in reviving the concept and the craft of building Malay *gerbang* (arch gate)¹⁵ was, “to create an ‘outburst’ of new innovation,” as, “people have yet to do (build or revive).” However, he firmly states that the new *gerbang*, “was based on tradition that had been neglected for years,” and that while, “attempts were made to revive them, [mostly] failed in terms of the concepts.” This suggests that apart from attending to their daily trade, some *tukang* were improving their skills while concurrently promoting an aspect of the craft that had been lost.

Alex aspires to a continuation of ‘storytelling’ within the building culture, which is currently missing. “We need this to brand the whole thing (Malay houses),” which then differentiates this type of house from the others and eventually, “will become a global brand.” Alex is persuaded that Malaysians should be proud of the craftsmanship that was once a symbol of strength and ideology of Malays, particularly in the Malay architecture.

In addition, while the numbers of traditional Malay houses are declining, Fauzi seems optimistic. He claimed: “In one month, around five [Malay houses were bought and disassembled],” and at this rate, “our calculation is roughly around ten more years,” for his team to become sustainable in the business of dismantling traditional houses. Thus in

short, he was claiming that six hundred houses are still available to be disassembled, although significantly optimistic, could be an advantage to the cultural heritage movement. This in turn is an argument for the plausibility of this study's hypothesis: to exploit existing Malay houses as a learning artefact, akin to an apprenticeship, however through the conservation process of disassembly and assembly.

4.7 Conclusion

The master *tukang* was defined not only by his skills and knowledge, but also by his spiritual and cultural aspects. The opinion of subjects; in particular *tukang*, practitioners and scholars differs in terms of theory and practice, however, homogeneous when it comes to generalization of a culture that is inclined towards Malay and Islam culture. It is apparent that knowledge and dexterity of *tukang* in the past are remarkable in their meticulousness and use of limited manual tools, meanwhile contemporary *tukang* may have traits similar to them. Nonetheless, the aspect of practice had developed and contemporary *tukang* who still practice the traditional trade had compromised ritualistic endeavour to much more practical ones, perhaps being cautious with their Islamic belief. Nonetheless, the *tukang's* commitment to the traditional techniques in Malay building suggests that the Malay building culture could survive in the modern period, and that the practice is on the verge of developing further. This is only possible with the interest of young generations and the awareness among people and heritage institutions within Malaysia.

In essence, the concept of disassembly and assembly (*buka pasang*), was highlighted as an important factor in the conservation routine, discovery or speculation of thoughts and distinction in craftsmanship for *tukang*. The Malay houses are said to have survived due to disassembly and assembly and the concept of conservation embedded was non-physical but favours the guarding of culture, practice and rituals as its main custody. Hence, the actions in disassembly and assembly (construction techniques, workmanship, administrative methods, labour system and others) have been found to be crucial in both the preservation of heritage artefacts as well as the knowledge and skills that are inherited.

Eventually, this could be revealed from the artefact itself; the Malay houses, where current *tukang* were reported to learn from what was

uncovered from their meaningful actions and wishful thinking during the disassembly and assembly process. As a reference and 'case study' for future work, these component-based houses and the actions of 'exploring' them, acting similarly as a *Guru Asal*, a concept that was initially meant for spiritual guidance, however could indicate a manifestation in the embodiment of the *tukang's* skills and knowledge. In short, the notion of disassembly and assembly of Malay houses encountered during fieldworks suggest that it is influencing the *tukang's* journey within the Malay traditional craftsmanship. Chapter five examines this impulse of discovery and learning process as an alternate knowledge reproduction or partly as part of an unconventional way at defining apprenticeships within the traditional Malay building culture.

Chapter Five.

Apprenticeship in Disassembly and Assembly

5.1. Introduction

The findings from Chapter 4 described the experiences, opinions and aspirations of subjects directly and indirectly involved with traditional Malay structures contributing either in the building trade or through scholarship. All of the subjects advocated the revival of local indigenous Malay craftsmanship concerning Malay house building culture as necessary to prevent the loss in both tangible and intangible values, although there are differences in the intentions and opinion; be it in practices, rituals or attributes of building participants. Moreover, the subjects agreed to the importance for skills and knowledge associated with the building culture to be passed down for future generations.

In this chapter, the discussion centres on the revival of Malay building culture from the potentiality in the current relationship of *tukang's* practices (ie. thinking, action and performance), the traditional procedure in disassembly and assembly and the existing artefacts (ie. house, tools) involved. Specifically, this chapter is concerned with the cultural design and the ritual ceremonies that are performed, rather than the static physical structures involved.

The practical hands-on experience of new apprentices in performing the disassembly and assembly process of Malay houses forms the basis of this research. The experience revolves around the notion of a spiritual practice that has been passed down and given meaning throughout generations. Hence, the introduction within this chapter attempts to outline the attributes of a Malay *tukang* with reference to the Malay culture that has spiritual inclinations, but also taking into account the perceptions and opinions from the research subjects who continue to practice the art of traditional Malay house building. The persistence of traditional craft in Malay building demonstrated the relevance of the practice within contemporary society.

In parallel, the author agrees that the meaning in Malay building culture is embodied in the materials, tools, measurements and action of *tukang*

and now the apprentices. The building artefacts together with all associated physical structures and processes: the owners, the site or *kampung* (village), practices and rituals of Malay building craft, community relationships, interpretations are in their entirety a reflection or an embodiment of each other. *Tukang* or apprentices are paramount within this equation as they are not just a builder, but the bearer of Malay buildings culture, skills, knowledge and authority. As a result, all of these elements are integral to the very notion of the house form, symbols, function and its assembly process, as well as subsequent copies (or development) of it throughout the years.

Secondly, the study argues that the heritage of a traditional Malay house is better represented as an amalgamation of tangible and intangible (or explicit and tacit) aspects in both the artefact and practices (including rituals) within Malay building culture; expressed through the performing act of disassembly and assembly. While the house represents the tangible and embodies the intangible, similarly, the *tukang* (and other participants within the disassembly and assembly process) demonstrate both aspects of tangible heritage such as in the actions of bodily skills and the intangible knowledge in skills and rituals. As such, the phenomenon of practising disassembly and assembly provides an example of how specific knowledge and dexterity can derive from both an artefact and the manner in which its parts are physically intervened with.

Finally and of significance to this study, it is suggested that the disassembly and assembly process - relating to both its poetics (intangible or immaterial) and technical (tangible and material) representation, was and shall remain as part of the apprenticeship-style of learning in the passing of legacy within this traditional culture. The emphasis on disassembly and assembly should be advocated and given greater importance in contemporary practice. Therefore, Chapter Five attempts to clarify the importance of disassembly and assembly process that was considered instrumental to the preservation of culture and the revival of the Malay *tukang's* knowledge and dexterity in the past, which could reconcile the philosophy of a *tukang's* craftsmanship in contemporary practice. It explores the notion that the physical artefacts of Malay building craft is a socially communicative act of explicit and implicit knowledge, as an affordance³⁰⁹ to a sustainable approach to skills and knowledge transmission and eventually for its subsequent

reproduction. It occurs subliminally within *tukang*'s and apprentice's somatic actions and interpretations or reflection through the disassembly and assembly process involved, analogous to the affair in the apprenticeship-style of learning. This is critical when master *tukang* in Malay house-building culture are declining, while opportunely some of the artefacts (ie. traditional Malay houses and other crafts) are still surviving.

Although lacking the spiritual and cultural essences, the concept of reverse engineering practised in modern culture provides a conceptual framework to technically understand disassembly and assembly process as a facilitator to the 'discovery' of tangible as well as intangible knowledge from physical artefacts. Moreover, in the study of Asian architectural heritage such as the traditional Malay house, it is important to consider the contextual representative of the Malay house beyond its geometric character, as a 'dynamic' and collective artefact. This advocates the process of disassembly and assembly as an active process, where each building component is treated as a living object that is unique.³⁷³

The heritage artefacts are also defined as 'active' rather than passive or fragile, where careful and procedural manipulation of physical examination leads to the understanding of form, technicality and histories with which it is associated. Hence, the study adopts the concept of performing the heritage, a process that re-enacts the physical and spiritual past and finally leads to the reproduction of similar or improved version of the original artefacts explored.

Relating the disassembly and assembly to the 'discovery process' again suggests that it has similar connotations to the apprenticeship-style of learning discussed in section 2.4.3. As common apprenticeships rely on oral, instructive, observation and mimetic procedures of a certain practice, the disassembly and assembly simulates parallel vocational training in a form of repetitive actions, often mimetic, and cognitive reflections embedded in Malay house-building procedures. In addition,

³⁷³ Both the house and building components as suggested in this study provides 'meaning' and hidden knowledge. The outcome of this requires contemporary *tukang* to piece together the uncovering of past knowledge and skills of previous *tukang* who made them. Past elements could also be interpreted as the embodied *semangat* or the *Guru Asal*.

the interactions of *tukang* or apprentices with the artefact and other building participants speculates the importance of disassembly and assembly process in resembling the act of obedience and hierarchy manifested in the apprenticeship-style of learning. The study provides evidence from the fieldwork conducted, while suggesting that the constant outcome in the interpretation and negotiation of the Malay-house-building culture, through performing disassembly and assembly, echoes the dynamic nature of vernacular architecture, particularly of Asian architecture, and its relevance within contemporary.

5.2. The Spiritual Practice

The conclusive definition of Malay craftsmanship and Malay *tukang* in regards to their knowledge and skills is contested - and therefore not intended to be concluded within this study. Rather the aim is to establish a premise to support the conceptual hypothesis of the qualities of *tukang* or apprentices, their practices and the relationship in the apprenticeship-style of learning within disassembly and assembly. Literature on Malay *tukang* is limited as their past and existing skills and knowledge resides primarily in oral tradition and embodied in the actions and rationale of research subjects that are passed down, re-enacted, interpreted and negotiated by the subjects and the people before them. This is apparent, as the qualities of Malay *tukang* and the Malay house-building culture has changed through time in order to be relevant to contemporary conditions, corresponding to the dynamic nature of vernacular architecture locally and worldwide.

Previous chapters examined the development of the traditional Malay house especially through the use of materials, building practices and the broader cultural environment; similarly the skill-sets and knowledge derived from traditional construction that has evolved. Nonetheless, recognisable traits that underpin the practice of Malay *tukang* is in the spiritual inclinations that has influenced Malay architecture, building procedures as well as the in the actions of Malay builders. Both the *tukang* and the complete building is associated with the spiritual essence, however the study emphasised the importance of the practice as being spiritually induced, even within contemporary.

The spiritual practice of Malay *tukang* is said to have similarities with other traditional building culture within South East Asia, however, the

significance lies in the aspect of the impermanence and constant interaction it has with the artefacts in a form of practice and performance. In short, both of these facets narrate the action of disassembly and assembly. Chapter Five attempts to relate the attributes of *tukang* and the required knowledge and dexterity that is instrumental to the Malay building culture. Subsequently, it becomes a pretext to the passing of mastery, where the attributes of *tukang* accolades in the apprenticeship-style of learning, believed to reside and re-enacted through disassembly and assembly within the Malay building culture.

5.2.1 *Tukang's* Attributes

The four attributes of past *tukang* in Malay building culture were explained³⁷⁴ where a *tukang* possesses different traits that require various skill-sets and knowledge in Malay house-building procedure. Being a *tukang* (craftsman) and a carver primarily requires a technical ability in tangible actions, while acting as a *pawang* (shaman) or a *ketua adat* (Imam or religious leader) requires a poetic interpretation of the house, from its physical characteristics to the construction process.

The procedural nature of the building itself, in its initial preparation up to its assembly, involves various participants and therefore requires multiple social relationships. Eventually, this calls for a *tukang* to take on different 'professions' according to the qualities that are required at a particular stage of building. This is relevant due to the compact scale of a Malay house and the ability of the *tukang* himself. Despite this, the author agrees that the four attributes of *tukang* manifests to the Malay house-building procedure of Malay *adab*, *adat* and *tertib*³⁷⁵ as it is in line with the building operations. Hence a master *tukang* must attain the skills and knowledge of these *adab*, *adat* and *tertib* which illustrate that the building culture is both cultural or spiritual and technical or strategical.

³⁷⁴ Rahman (1999) described *tukang* as part (i) craftsmen, (ii) *pawang* (shaman), (iii) *ketua adat* (Imam or religious leader) and (iv) carver. Refer section 2.3.1.

³⁷⁵ *Adab* is the assigned values to human behaviour or ethics, *adat* relates to customary building practices while *tertib* refers to the order or principle of the prescribed order in Malay house building. Hence an accomplished *tukang* could conduct all these values perfectly by himself.

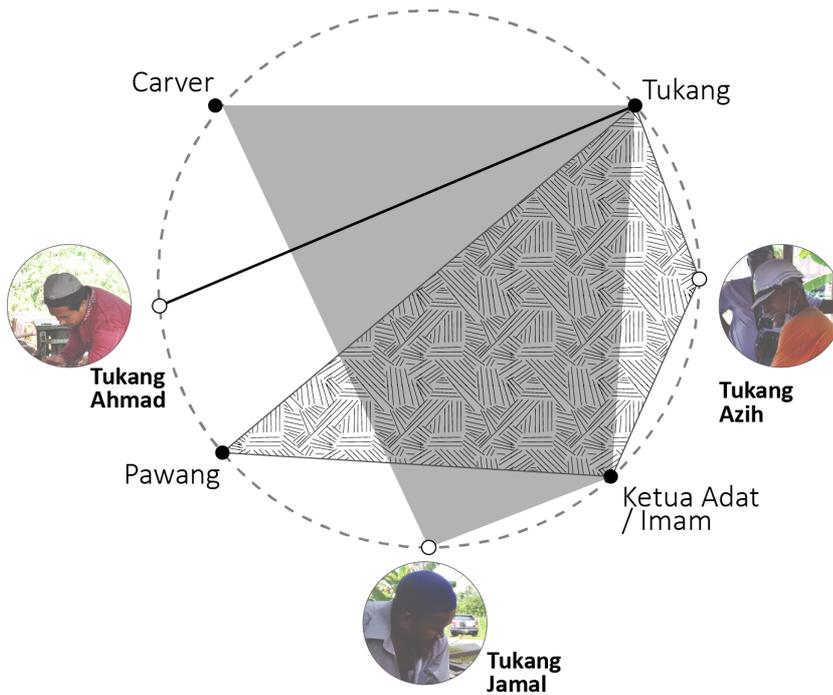


Figure 5.1 The attributes of a Master Tukang in relation to the tukang interviewed. Source: Author, 2017

Adab speaks of the moral values portrayed in the characteristics and behaviour of the human, hence associated with the requirement and knowledge of an *Imam*, who is considered a moral compass among communities. *Adat* relates to the customs and traditions in Malay house-building, although associated with the position of an *Imam*, could also narrate the importance of a *pawang*. Views within the Malay culture, be they religious or cultural, may be inclined towards spiritual or mythical, in which a *pawang* is generally affiliated. Meanwhile *tertib* stresses the requirement of order and organisational qualities in Malay house-building where usually a *tukang* is technically accomplished. The 'order' within the culture also expand towards 'beauty' in the form and embellishments of a Malay houses, hence a carver is also associated.

The affair within the building culture is considered twofold: the *tukang's* relationship between artefacts and the participants involved. While the former relates to the procedural actions in the making and assembly of building components, the latter relates to the affairs of people - including the apprentices, the mother of the house, labourers, village folk and others - throughout the initial planning and execution of house-building. Although this duality (artefact and participants) represents a definite separation of non-living and living entities, the study implies

that they are both assimilated by the philosophy of anthropomorphism practised by past Malay societies in the building culture; both the house and building participants are living objects. This has been described as a *semangat* (soul-substance), believed to reside in the artefacts to 'correspond' with the concept of *ruh* (spirit) associated in the building participants and inhabitants. Hence the inclination of *semangat* and *ruh* demonstrate that the *tukang's* attributes are spiritually driven.

For that reason, it suggests the motivation for a *tukang* to possess the four attributes (Figure 2.9) - while they are currently not relevant to 'status' they do demonstrate wisdom or the ability to communicate at a different echelon of the building procedure in both physical and spiritual. The motivation is relevant as the building process is strictly operational and a lengthy affair. Moreover it could be justified from the norm of Malay communities where constructing houses may have been a common trade among able-bodied Malays³⁷⁶ or merely a social obligation within a village.

5.2.1 Traditions in Contemporary

Conversely, with the introduction of Islam came the concept of one God, however, the Malay building culture retained some remnant aspects of animism, Buddhism and Hinduism, which some contemporary *tukang* acknowledged but does not manifest.³⁷⁷ Whilst, it was claimed that non-Islamic concepts had diminished due to *syirik*³⁷⁸, the empathetic recognition of of past legacy has dignified the roots of the Malay culture through the *Guru Asal*³⁷⁹. Though not consciously admitted by contemporary *tukang*, the notion of *Guru Asal* was said to be an inspiration for them in their subconscious minds and actions. Constant revision towards the past, including inspiration from *Guru Asal* is seen as

³⁷⁶ As claimed by Rahman (1999) most Malays could build as often house construction was only a part-time occupation. Nonetheless, the disassembly and assembly portrayed in all house-building is thought to act as a communicative means in displaying building procedures.

³⁷⁷ *Tukang* were quick to affirm to their Islamic belief systems, being careful with the words that they chose as to avoid *syirik*.

³⁷⁸ *Syirik* is the sin of practising polytheism or idolatry. Refer section 4.5.2 on the aspect of *syirik* and its implications to the development of building culture.

³⁷⁹ An approach in Malay craftsmanship described by Nik Rashiddin that is spiritually inclined towards the lineage of craftsmanship embodied in an artefact or ideologies: Refer Section 1.1 (ix) and 4.3.2.

a symbolic method for *tukang* to inspire, experiment and adopt within their craftsmanship. Inevitably, this demands a focused will and the discipline to do so.

While this is the case, contemporary *tukang* are more familiar with the Islamic scriptures as Islam is observed faithfully. Therefore, a *pawang* may have adopted an Islamic approach in conducting 'magic', although fragments of traditional practice (either in actions or thoughts) may persist. This implies that the attributes of the *tukang* as a *pawang* (shaman) or a *ketua adat* (Imam or religious leader) are analogous; therefore a *tukang* can easily depict both roles.³⁸⁰ The outcome of this is a key notion within Malay craftsmanship: the aspect of humility and sincerity. In the fieldwork, practising humility was quickly associated with both Islam³⁸¹ and the Malay culture, eventually inspiring *tukang* in his sincerity in learning and developing the Malay house-building techniques.

Presently, Malay building practices mainly occurs after the artefact is constructed,³⁸² mostly in conservation activities. Thus this may suggest that there is a superficial advantage in *tukang* possessing distinct 'attributes'. While the research subjects concur that it was required and possible in the past, it is unusual at present. However, a *tukang* may develop multiple attributes during his lifetime, thus varying from one *tukang* to another. The study posits that many of the changes in practice and rituals are due to social hierarchy, the introduction of Islam and the social acceptance of the belief systems and techniques from Malay ancestors. Hence, from the characteristics of humility and sincerity practised, a *tukang* remains accepting to new ideas while learning, developing thoughts and adopting skills within their means. Moreover, as evident in contemporary practice, viewpoints and opinions are

³⁸⁰ The role of *pawang* and *ketua adat* is not only significant to the spiritual element of the house, its inhabitant and the environment but to the physical house form. The proportions of the house and embellishments depicting cultural or spiritual tenor were sometimes partly as a result of *pawang's* or *ketua adat's* guidance. Thus some elements are shared by both (Gullick, 1987, p.182).

³⁸¹ Marchand (1999) may have described these qualities among Yemeni minaret builders, as they too embrace the Islamic religion as part of the value within practice.

³⁸² This is mainly due to new Malay traditional houses are rarely built, hence we rely on existing Malay structures.

constantly exchanged, while new stakeholders such as architects and contractors are introduced in order to integrate the modern with traditional approach to Malay house-building.

While it was claimed that *Tukang Azih* possess the characteristics of a *pawang*, it is not seen as directly benefitting his current practice, however, it is clear that this has indeed influenced his doctrine³⁸³. Similarly in becoming an *ustaz* or *ketua adat*, there is no visual evidence where *Tukang Jamal* had adopted 'religion' in his craftsmanship; rather it had defined his characteristics in becoming a *tukang alim* or a good *tukang*. And yet, both *tukang* employ simple Islamic rituals that were common³⁸⁴ - justifying that what was practised is more important than distinct attributes implied upon *tukang* to act. Furthermore, it could be argued that the attributes of a *pawang* and *ketua adat* may not be as relevant for *tukang* today due to the decline of traditional beliefs in contemporary practice, but gives grounds for the influence of craftsmanship unique to each. As a result, contemporary *tukang* may find it unnecessary to acquire a higher status in society - associated with a *pawang* or *ketua adat* in the past, as currently economic requirements take precedence.

In the same way, the philosophical underpinning of multiple attributes was observed to be less rigid in present day building culture. The *tukang's* ability to master more than one attribute today is due in large part to the rational requirement to see a project through from the initial agreement with the client until the house is occupied or later altered and moved. This demands for a *tukang* to acquire a pragmatic characteristic. More importantly, to grasp the collective mastery of attributes; a contemporary *tukang* or apprentice has to be involved in a persistent cycle of pragmatic learning in order for them to conduct the building culture effectively and holistically.

³⁸³ Though a *pawang* was initially to appease the spirits or to bridge the aspect of immaterial and material, it may also be useful as a 'defence' from bad spirits. Old traditional Malay houses were always thought to have spirits (or ghosts) living in them. Hence *Tukang Azih*, albeit does not practise past rituals rigorously, uses Islamic prayer in order to prepare himself for any mishaps if anything tends to happen.

³⁸⁴ One notable example is to praise God in every action conducted, especially when working with or entering a traditional Malay house.

An important thing to note in regards to these attributes is that they can only be a fragment of their mastery from within the building culture. Some, if not all knowledge, skills and values are closely shared with other Malay crafts and cultural practices.³⁸⁵ Hence the *tukang*'s ability may extend beyond their initial responsibility to master the attributes stipulated, as it may comprise similar conceptions in the 'making' process. However, in essence, the study argues that multiple attributes described - although insignificant to present *tukang* - are fundamental to the continuation of the *tukang*'s legacy. In conditions where the value of a craftsman, carver, *pawang* or *ketua adat*'s skills have been superseded by modern Malay practices or the 'grade of occupational prestige'³⁸⁶, *tukang* should retain the responsibilities of these roles as the number of practitioners related to them has declined. In the same way, the development of knowledge and dexterity, in particular in the *adab*, *adat* and *tertib* should always be a significant priority for the sake of the preservation of a traditional Malay building-culture.

5.2.3 *Tukang Alim and Tukang Jahil*

The four attributes discussed, the concept of *Adab*, *Adat* and *Tertib* as well as the affairs in the artefacts and human interaction are intertwined, which forms the principle for the mastery of *tukang*. To discuss and synthesize these elements further, we could distinguish the fundamental knowledge that exists; technical or strategic knowledge and the cultural or spiritual. The first relates to the 'expert' knowledge in planning, fabrication and assembly while the second involves a deep understanding in tradition, ritual or cultural matters.

Although building the Malay house is modest in the construction concept, it requires a specialised knowledge and skills such as in measurements, proportions and planning. It is the craft of preparing building components, organising building procedures and assembly, and mobilising human resources such as builders as well as village people.

³⁸⁵ Alex described the two brothers who were accomplished goldsmiths but capable in building Malay houses (refer section 4.2.1.1) while Dr. Muhammad described the knowledge of some *petua* (tip), derived from other Malay arts and craft as well as daily cultural activities.

³⁸⁶ See: Alatas, S.H., 1968. The Grading of Occupational Prestige Amongst the Malays in Malaysia. *Journal of the Malaysian Branch of the Royal Asiatic Society* 41, 146–156.

The process is technical in nature, however, is dominated by social hierarchy, intuition and bodily judgments³⁸⁷. This form of knowledge and skills is more of a general nature,³⁸⁸ through an apprenticeship process to a master builder.

Meanwhile as the house is also seen as a cultural memory and symbolic meaning, a *tukang* must comprehend the basis of Malay culture which is the knowledge and skills derived from traditional narrative of Malay building culture. Hence, the second type of knowledge and skills includes the lifecycle rituals and cultural performance that are conducted in accordance to the different phases of the traditional construction. Building the Malay house is not just about skilful arrangement of timber posts and timber beams but is performed for cultural undertaking associated with the spiritual practice.

Despite this, perhaps, the attributes of a *tukang* could be made simpler by introducing the term *Tukang Alim* or *Tukang Jahil*.³⁸⁹ This is a clear distinction relating to the spiritual and non-spiritual practice. The concept of *Tukang Alim* describes an ideal quality when a *tukang* is proficient in his practice while constantly bestowing a superior and spiritual being such as God. This is due to the present-day *tukang* claiming to draw 'strength' and focus from their devotion by worshipping God. While the quality of his workmanship may be the result of hard-earned experience or practice, the connection with God is similar to previous ideologies (animistic, Hindu or Buddhist) by surrendering to a higher supreme being. In doing so, a *tukang's* mastery is considered whole and the results of the masterpieces believed to be flawless. Subsequently it implies that his mastery not only benefits himself but others. This is then associated with the notion of *rezeki*³⁹⁰,

³⁸⁷ Refer to section 2.2.2 where traditional *tukang* use parts of their body, particularly in the fingerwidth and arm spans to formulate the building size and proportions in accordance to the spiritual beliefs and cultural inclinations.

³⁸⁸ As mentioned, the Malay house within the Malaysian Peninsula is generally similar in construction and ritual, however distinct in its form and embellishments. Therefore, it was said that *tukang* from other provinces or *kampung* were also commissioned to build houses in other states.

³⁸⁹ Imparted by Haji Annuar, the Director at the Architect department of Jabatan Kerja Raya (JKR) in Terengganu, Malaysia.

³⁹⁰ Practised by Malays, a conception of fate derived from Islam, such as in honest earning to make a living. Malays believed fortune to be directly from God, Allah.

which fosters on devoting to the development of knowledge and skills in ‘making’, rather than purely wealth or fame.

In contrast, a *Tukang Jahil*³⁹¹ was seen as an incompetent person, opposite to *Tukang Alim*. In labour, the means for wealth from greed is a main priority, which comes at a cost; lacking craftsmanship quality due to the absence of know-how and physical ability. This is also seen as turning away from his religious duty as a maker. One could argue that the term *tukang jahil*, could also be used to represent the *tukang* who is illiterate in the process of *adab*, *adat* and *tertib*. More importantly, it could be justified that *Tukang Jahil* does not possess the essence in the four attributes pertinent within Malay house-building, resulting in the outcome of his mastery to be meaningless; practically, culturally and spiritually.

Nonetheless a good *tukang* or *Tukang Alim* must possess both the expert knowledge of technical building process and the ritual practices of cultural ambitions. It is not separated, but rather a fusion and amalgamation of both, as the construction requires spiritual concepts while the ritual requires practical know-how. In short, the two knowledges formed a dyadic pair, and also suggesting that the construction know-how is providing the means for the ritual and spiritual ambitions to perform. This relates to the concept of disassembly and assembly which is discussed in the next section.

5.3. Apprenticeship-style of Learning

Knowledge transfer, learning theories and apprenticeships are explained in previous chapters, describing ways knowledge is transmitted within an oral tradition and the extent to which it occurs within the Malay house-building culture. In apprenticeships for example, it was described how apprentices learn from the actions of their masters, often from an unconscious didactic process. However, in this study, the artefact itself becomes a source of inspirations from the embodied past physical and spiritual workmanship, the construction procedure and the bodily performances of the actors, comparable to the language of apprenticeships. The author further took inspiration from a modern technique referred to as ‘reverse engineering,’ a modern methodology

³⁹¹ *Jahil* is a Malay word literally translated as ignorant.

to acquire specific knowledge in a discovery and learning process. It is claimed to be similar to the actions of disassembly and assembly that involves physical interactions and the subconscious knowledge discovery and investigation. However, the concept of reverse engineering lacks the spiritual and the emotion that exists in traditional apprentices and in the practice of Malay house-building.

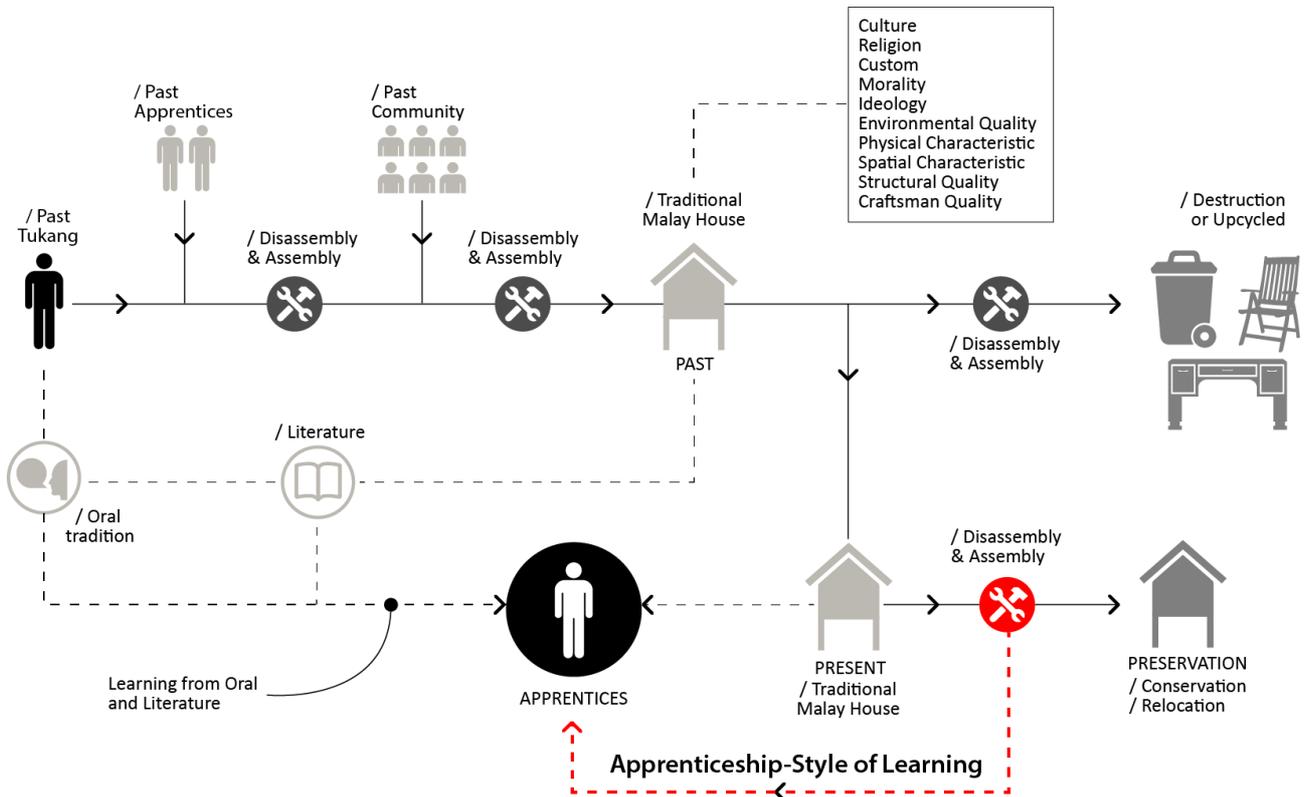


Figure 5.2 Diagram to narrate the process of Apprenticeship-style of Learning through Disassembly and Assembly of Malay Houses. The diagrams also demonstrate the practice of disassembly and assembly at different period in the lifetime of a traditional Malay house. Source: Author, 2018

Conversely, the study suggests that the disassembly and assembly process of the Malay building culture is in fact a form of apprenticeship that provides the foundation for an apprentice to learn, discover and reflect on his experiences. The study posits that this is not a new process within traditional Malay houses but is performed in a manner that was rooted in past Malay culture³⁹². Disassembly and assembly is deliberately meant to be observed, learnt and continued to practise as it

³⁹² Some examples include house additions to cater for larger family or need, relocation activity, taken apart and gifted as inheritance and many more.

is a socially communicative act that defines and conserves the meaning of the building culture. It is argued that this form of 'apprenticeship' occurred both consciously and unconsciously even in current conservational practices where disassembly and assembly procedure is present. Whilst disassembly and assembly were considered only as a *rukun* or the 'code of conduct' in house-building, the study established it as part of a culture in 'knowledge sharing' or 'knowledge discovery' that inspires the *tukang* or apprentices without them realising. More importantly, performing the disassembly and assembly is instrumental to the revival of spiritual practices and inspiration from past craftsmanship, which corresponds to the idea of *Guru Asal*.

The distinct types of knowledge and skills - the tacit and explicit, is discussed. It was revealed that both tacit and explicit is part of the apprenticeship-style of learning that are also evident throughout the disassembly and assembly. It is demonstrated that performing disassembly and assembly highlighted the explicit, while advocating the creation of tacit. The subsequent section argues that traditional Malay houses, as an artefact, offers the groundwork for this argument. The modular construction, its affordances, cooperative and cultural values are some of the characteristics that help to perpetuate the idea of disassembly and assembly, hence promoting the apprenticeship-style of learning from both the artefacts and performance related.

Finally, the study narrates the elements of disassembly and assembly as a facilitator to the discovery of past craftsmanship and its reflection within the present, as a way for the cultural heritage of Malay building culture to be passed on – similar to the aspirations in apprenticeships. It was argued earlier that this opinion may not have been a primary pretext in present literatures, but the author consistently proclaimed that it was already rooted within the traditional building culture. The traditional practice of disassembly and assembly has to be constantly and pragmatically re-introduced in order for present apprentices to imitate the tradition and eventually find ways to utilise into the present.

5.3.1 *Kampung* as alternative to guilds

Prior to discussing the apprenticeships culture, it is imperative to highlight the aspect of knowledge and skills transmission within the Malay building culture. The lack of a Western-style guild-structure

system for example, is seen to restrict the traditional apprenticeships and the development of Malay crafts trade. However, though it falls short by the standards of Western apprenticeship, the Malay building culture in a *kampung* (village) represents a relevant approach, appropriate to the trades of traditional Malay *tukang*. The *kampung* structure is dependent on the hierarchy of the Malay community and its activities, including the building process. Hence in an ideal condition, it could act similarly to the function of guilds, but informally and developed communally. The study does not attempt to compare or adopt the guild system, however, it argues that *kampung* also provides the means for fostering the apprenticeship-style of learning and the development of traditional trade, paralleled with the cultural progress of a particular place. The cultural setting of *kampung* structured the *tukang* and apprentices 'learning' environment. This provides the premise that the act of heritage transmission does not occur individually, rather in collaboration with the community, as in the ceremonial act of disassembly and assembly.

It was claimed that most of the able-bodied residents within a Malay community were somehow and at some point a house *tukang*. This statement may be overly general as the term *tukang* itself was used specifically to portray a specific set of knowledge and skills (ie. 'wood *tukang*', 'steel *tukang*', 'gold *tukang*')³⁹³. Having said that, although most people in traditional communities may have experience in building houses, many would lack the qualities required of a master and from the pre-requisite of Malay craftsmanship: *adab*, *adat* and *tertib* or the functional, cultural and aesthetically pleasing qualities.

Ceremonies held during the construction of the main structure of the Malay house demonstrate the importance of the *kampung* as a setting, where the building procedures were collectively shared and demonstrated, hence this could be a form of knowledge dissemination among the *kampung* people³⁹⁴. Coordination skills as well as management in rituals or *adat* at this point lie in the hands of a leader, normally a master *tukang*. The rituals were conducted as a ceremonial

³⁹³ Refer section 1.1 (iii).

³⁹⁴ It was speculated that the ceremonial activity of building a house not only to appease the house spirits or a cultural assembly, rather a way of passing crucial understanding of building techniques and methodology. See Ariffin, S.I., 2001. Order in traditional Malay house. Oxford Brookes University.

activity in a procedural manner, which provides the means for direct observations and participation from communities. In short, the knowledge dissemination occurs unconsciously within a formal account that prescribes a learning process. Conversely, a *tukang's* responsibility is to manage this multitude of operatives, having to supplement different sets of skilled persons including laymen, women and children.

The hierarchy within a *kampung* was also a crucial factor in the development of the apprenticeships when *tukang* were respected for their skills and knowledge in technical terms. Though there are conflicting arguments regarding the status of past *tukang*³⁹⁵, in traditional communities, the Malays showed respect towards people proficient in knowledge, in particular who conducted rituals³⁹⁶. The amalgamation of Islamic and mythical belief was evident in the rituals conducted and prayers chanted during house-building. The *tukang* are therefore afforded a great amount of respect, placing them highly in the status of the community even though some argued that generally they lacked wealth³⁹⁷.

Unless handpicked by the Sultan, a *tukang* may be considered as the *Tukang Di-Raja* or Sultan's *tukang* if he has the ability to build large palaces with perfection, ranking him among the aristocrats. There is less evidence of the type of engagement a *tukang* had with the clients, however, besides the class difference, it is suggested that either the level of knowledge or his contribution towards the society informs it. Regardless, this status demonstrates that the *tukang* was capable of influencing the community, and therefore contributed towards the development of Malay building culture.

Within the Malay culture itself, respect was given and reciprocated with particular reference to difference of age. The old must be respected and

³⁹⁵ In the fieldwork, most of the modern *tukang* interviewed disregard themselves or past *tukang* as a prominent or respected figure (noble or aristocrats). This is in contrast to the opinion of scholars or researchers. Refer section 4.2.1.1.

³⁹⁶ Malays were thought to be inclined towards mystic beliefs towards the spirits and the environment, even after Islam was introduced. It is still believed to be practised by some until now, with or without the mythical intentions.

³⁹⁷ *Tukang* Jamal, Azih and Ahmad regard *tukang* as only a normal person and rely on people supplementing daily needs (e.g. food) rather than having prosperity. See section 4.2.1.1.

their ideas must be acknowledged, to do otherwise would be considered disrespectful. Therefore, Malay craftsmanship was revealed selectively based on the wisdom of the *tukang*, and whom he considers to be worthy to acquire his knowledge. Though the hierarchy advocates learning as an inclusive activity within a certain group, it ensures that the knowledge is passed down 'exactly' as presented by their forefathers. This is instigated by the fact that apprenticeships were normally from the same lineage of kinfolk, where the father or the 'breadwinner' of the family dominates the life of his nuclear family. As a result, knowledge and skills were passed down effectively to the offspring, with a great deal of passion for the continuation of the family legacy. However, at present, the influence of family legacy in Malay house-building differs greatly, both due to market demands and the pressures of modern culture.

The aspect of hierarchy within the building process can be seen in the type of labourers (*awok-awok*) on site. The master *tukang* is the main person in charge of the whole construction, dealing mostly with the client's requests and the selection of materials as well as quantities. The second in command, considered also as a *tukang*, will be mostly on site while the master *tukang* is away for administrative responsibilities, though the master himself can take this role. This *tukang* measures and marks the building components for the apprentices and labourers to work with. The apprentices are divided into two groups, one who cuts the material, the other who makes the detailing such as tenon holes. The procedures are systematic and conducted in phases where the apprentices will remain at their tasks until all the components are completed. The division of the building tasks and procedures encourages efficiency and prevents mishaps as Malay building culture demands perfection due to its characteristics: a lack of documented building plans, component-based and prefabricated construction techniques.

It is observed that although hierarchy within building construction exists, the *tukang* is always at hand should problems and issues arise from the apprentices, leaving the apprentices to continue working only after the problem is 'solved'. Similarly, in the learning theory of constructionism, the learner (apprentices) and the one who teaches are constantly in the feedback loop. Moreover, the learning methods involved direct hands-on 'demonstration' without the need for intermediate 'craft learners'. This is due to the learner being involved directly with artefacts as well as

having initial tacit knowledge associated. Moreover it is a didactic process that requires verbal instruction and most importantly reasoning, which is often difficult for the apprentices³⁹⁸.

Tukang are seen as individuals with their own sets of skills and worldview. However, Malay culture insists upon being and acting collectively, strongly demonstrated in the concept of *gotong-royong* (mutual help)³⁹⁹. The building procedure, from the initial sourcing of material, the selection of a site and the alignment of the first column is conducted based on a direct relationship and interaction with other people who are technically non-*tukang*. The *tukang*, along with shamans and other volunteers, which may include the occupants of the house, will work mutually as is required, engaging in hard labour as the timbers are cut, shaped and brought back to the site by buffalos or river streams. In the selection of site, the 'mother of house' will be part of the rituals involved to achieve the *rasi*. Meanwhile, the initial assembly of the house will be part of an important ceremony within the *kampung* in order to celebrate the occasion.

It is in the collective effort that the concept of Malay craftsmanship should be deemed as a communal identity, with the spirit of cooperation limited within the *kampung*. Hence a *kampung* could be seen as a platform where these collective efforts are conducted and flourished. In the same way, ceremonies are part of the *kampung* that conveyed the structure and formality where knowledge and skills are portrayed. Subsequently, the culture is being mutually celebrated, in particular the building culture.

Unfortunately at present, the number of *tukang* and apprentices has declined significantly due to limited work on such heritage buildings. The *Adiguru* or master craftsmen acknowledged by the government are currently ageing, with few younger skilled *tukang* replacing their reputation. Nonetheless, the decline of the *tukang* is also in parallel with the decline of the *kampung* as well as its hierarchical organization. Though there is no concrete evidence in this relationship, it is argued above that a *kampung*, with all its limitation, provides the means for Malay building culture to develop. Without the support of the *kampung*

³⁹⁸ Similar to Wood (2010), the study faces challenges in trying to obtain verbal clarifications from the *tukang* to describe certain process and phenomena.

³⁹⁹ Refer section 1.1 (vi) and 2.2.7. for explanation on *gotong-royong*.

from the perspective of human resources, means of support and local rituals, the practice of Malay house-building is restricted. Nonetheless the ceremonial process within disassembly and assembly still persists, suggesting that the collective dissemination of knowledge and skills remains possible.

5.3.1. Tacit and Explicit

Contemporary *tukang* in the fieldwork expressed mixed opinions on the importance of indigenous traditional knowledge and skills within current practice. Most of the *tukang* agreed that it is crucial to understand traditional knowledge such as the rituals and the concepts behind building traditional structures, but somehow the knowledge is less significant to the practicality of construction or conservation at present. In contrast, present-day scholars who, while not competent to build the structures themselves, advocate that all *tukang* should be obliged to follow strict procedural and traditional techniques, including the rituals involved, in order to holistically preserve the essence of Malay house-building culture.

In reference to Frayling's outlook on craft⁴⁰⁰, this study claims that the distinct know-how of the *tukang* includes both tacit and explicit or formal knowledge and skills embedded in Malay cultural beliefs, which directly influence the physical construction of the house and the practicality of the building process. This is shaped by the *petua* (tip or prescription), rituals and Malay beliefs regarding house-building that were predominantly 'formal', 'fixed' or strictly traditional, yet adaptable to different situations. It may come through the adjustments made by generations of *tukang* upon requirements from the inhabitants, anthropometrics, 'magic measurements', outside forces or generational styles⁴⁰¹. Likewise, this is the case in the variations among the Malay houses built by the same *tukang*⁴⁰².

⁴⁰⁰ Frayling's perspective on craft; 'a distinction between types of knowing.'

⁴⁰¹ See; Ariffin, S., 2000. "A Mathematical Explanation Of The Magic Measurements Found In The "Taj-UI-Mulk" And The "Pawang's Book." Journal of the Malaysian Branch of the Royal Asiatic Society 73, 91–105.

⁴⁰² Dr. Fawaz recalled an ongoing research trying to identify the *tukang* of several houses within Negeri Sembilan whether it fits the craftsmanship and characteristic of Tukang Kahar's house. This suggests that a Malay house built by

The tacit knowledge of *tukang* is evident from their experience. This is rarely recorded in written form but fortunately the Malay building culture is considered straightforward - particularly in the construction techniques. The preliminary process of building a Malay house⁴⁰³ involves the *tukang* estimating the scale, size, height and amount of wood to be used, as well as the type of wood required based on the function and requirements from the house owner. The aspect of monetary budgets were rarely discussed, partly due to Malay houses that could be considered as a 'work in progress', potentially occupied prior to completion⁴⁰⁴. This information, which is premeditated as tacit knowledge, is drawn in a schematic drawing by contemporary *tukang* (with the help of architects) as explicit information that can be understood by their apprentices and labourers.

Making and preparing the components creates explicit knowledge, portraying the marking system, types of components and *tanggap*⁴⁰⁵ connections made, identifiable by apprentices, however, tacit understanding is similarly required prior to their assembly. Completed components, especially the roof structures, were initially assembled on the ground, hence the tacit understanding then becomes explicit. In this regard, the tacit and explicit knowledge depends on the hierarchy of a *tukang* and his apprentices as well as the disassembly and assembly process - without either, there will be an absence in some aspects of tacit or explicit knowledge.

The author argues that the techniques and poetics inherent in the organisation - specifically in the decision leading to the preparation of building components and the actual disassembly or assembly are the most demanding skills. A competent master *tukang* possesses this set of skills, with or without utilising any marking system on building components. For a master *tukang* or *tukang alim*, rarely the disassembly

a similar *tukang* could be visually distinct but may be possible to identify with physical inspection.

⁴⁰³ There are a few conditions in determining the size of the house requested by the house owner; (i) based on *dulang* size (Ariffin, 2001), (ii) height and length, and (iii) possibly the amount of family members he has.

⁴⁰⁴ Gibbs (1988) recalls a Malay house he had encountered, which was occupied after the roof and floors were in place, even without wall panels installed.

⁴⁰⁵ Malay term for their joinery system using mortise and tenon joints, utilising wooden pegs as fasteners and employing timber wedges to secure the joints.

and assembly process encounters any miscalculations or misjudgments, while an observer to the practice - such as the author, may be in doubt⁴⁰⁶.

Whilst there were claims that marking was not utilised by past *tukang*, the marking is necessary for the identification and association of components in their entirety. In the practice of contemporary *tukang*, mostly related to the conservation of existing Malay structures, markings are often already present⁴⁰⁷. Therefore, a *tukang* and particularly the apprentices must be cautious in understanding past marking systems as well as how they could exploit these within the current process. This is challenging in a building culture where there is a continuous physical integration between old and new (ie. in building components), sometimes indistinguishable to a non-expert eye⁴⁰⁸. Therefore prior tacit knowledge provides the means for explicit knowledge to appear and make sense.

While the building process is technically sound, the tacit knowledge described above has not been previously emphasised in previous studies. This is due to its 'intangible' nature, relying on reasons and the absence of tangible evidence. For example, sizes of building components are assessed systematically based on a *tukang's* and apprentice's past involvement in the building process – similarly in disassembly and assembly where structural requirements are often recalled 'by heart'. These can only be rationalised by the notion of *rasa* or *kena*⁴⁰⁹ in the

⁴⁰⁶ *Tukang Azih* claimed his ability to assemble building components without markings, but failed to explain or emphasize the rationale in his organizational formula. In some instances, his clients were in doubt of his ability in this process as normally building components are prepared first, before a complete and final assembly. For *Tukang Ahmad*, he used either chisel marks or pen markers to permanently identify the components and their relationship in assembly.

⁴⁰⁷ *Tukang Ahmad* continue this marking culture as he justified the reason to facilitate future disassembly and assembly to take place by others.

⁴⁰⁸ There are common instances where houses or part of them were disassembled and given as inheritance or were brought over and integrated with other building components to give a new life of another house. Therefore markings on these timbers could intermingle and create confusion. The best solution is to implement and adopt own marking system similar to what *Tukang Ahmad* had practised. Refer section 4.6.7.

⁴⁰⁹ Common word or grammar used to describe the hunch made unconsciously by *tukang* (Ariffin, 2001, p.101). *Tukang Azih* and *Tukang Jamal* often used the word *comel* (cute) or *molek* (delicately beautiful).

decision-making used, albeit the study predicts that it is entirely based on the apprentice's perception of the visual 'proportions'.

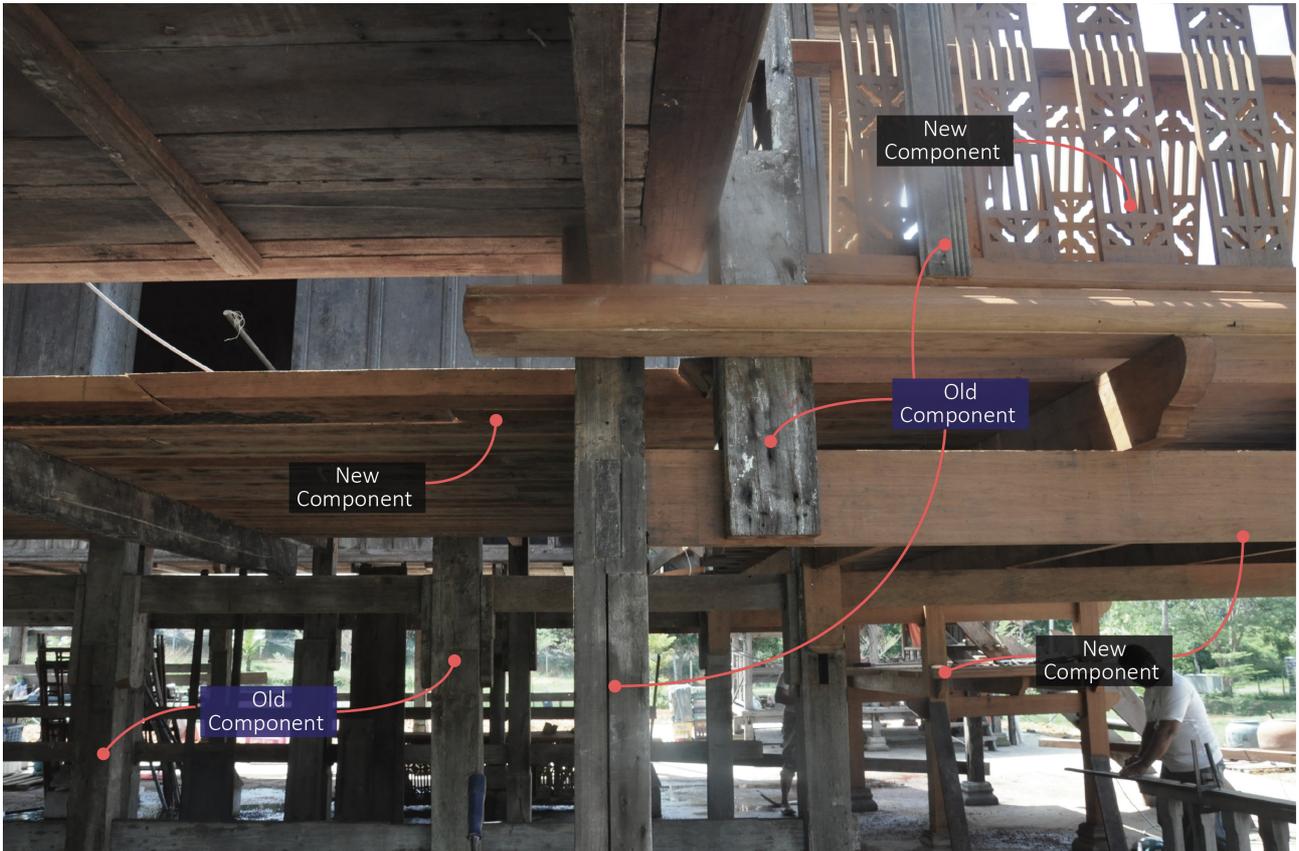


Figure 5.3 In most conservation projects of Malay houses, there will be a combination of old components from the original artefact, as well as new components – either from sawmills or salvaged materials from other Malay structures. Source: Author, 2018

The knowledge and dexterity in achieving *rasa* or *kena*, may only be obtained by 'experiences' or a *posteriori* knowledge⁴¹⁰ of apprentices in the field. Experiences are a result of sensory feelings⁴¹¹ that eventually express the impression of doing 'by heart'. There is an emphasis on this sensory understanding, particularly visual skills such as observation. Having 'an eye for detail' is one of the main proponents in the qualities of *tukang* and apprentices, which is both tangible and intangible in its

⁴¹⁰ As opposed to *priori* knowledge that is independent of experience, *posteriori* knowledge, according to Immanuel Kant; a philosopher in the modern era, is knowledge bound towards experiences. It is a knowledge concerning of 'things that could be different' (Branko, 2011, p. 78). Likewise, the Malay house may have homogenised techniques and form, but could have variations in terms of proportions and scales.

⁴¹¹ Described by *Tukang Azih*, with emphasis on visual feelings. Refer section 4.3.3.2 paragraph 7.

outcome. As a result, the eye is said to be synonymous with the intellectual ability of a *tukang*⁴¹². That being said, by observing, quick judgments could be made, which are potentially referenced from past knowledge and skills or meaningful previous experiences⁴¹³ of apprentices.

Observing past artefacts and their systems, such as a Malay house, is found to inspire contemporary apprentices within the building culture. It is not only seen as a reference but a source of ideas that could lead to certain progress when both tacit and explicit knowledge are known. The outcome of this explicit understanding could explain some past *tukang*'s justifications for the characteristics of existing houses that may often lead to other symbolic representations⁴¹⁴. The study emphasised that eventually all these 'discoveries' form the esoteric knowledge for apprentices who build Malay structures - as it is only understood by them, in particular through the process of disassembly and assembly.⁴¹⁵

Initially, many links are made by current *tukang* with past 'making' experiences in the disassembly and assembly process, and as a result, an apprentice could offer their own interpretations of different aspects of traditional Malay house-building culture. It is often derived from their own cultural beliefs or actions, which are carefully performed. Although their relationship with and knowledge of the past may have been selective and sometimes limited, they have approached it pragmatically in order to serve their present needs.

⁴¹² Haji Yusuf explained *tukang*'s proficiency in observations, associated in his actions or judgments and other related technical traits (Refer section 4.3.3.1). In addition, there are multiple cases where the *tukang*'s observation alone resulted in quick reasoning.

⁴¹³ However Christian Norberg-Schulz argues that perception, in this case the *tukang*'s consciousness, derives from their pre-existing knowledge about the things that they perceive. More importantly, these experiences are a result of experiences associated with values where the Malay house could be seen to perceive '*meaningful forms*' (Branko, 2011, pp. 138–139).

⁴¹⁴ Fauzi claims that a house could be 'read' as he recalls his interpretation of the heritage house of Haji Kundur project in Politeknik Port Dickson, Malaysia. See section 4.3.3.1.

⁴¹⁵ This could be extended to Malay boat *tukang* as they are potentially more competent in both trades.

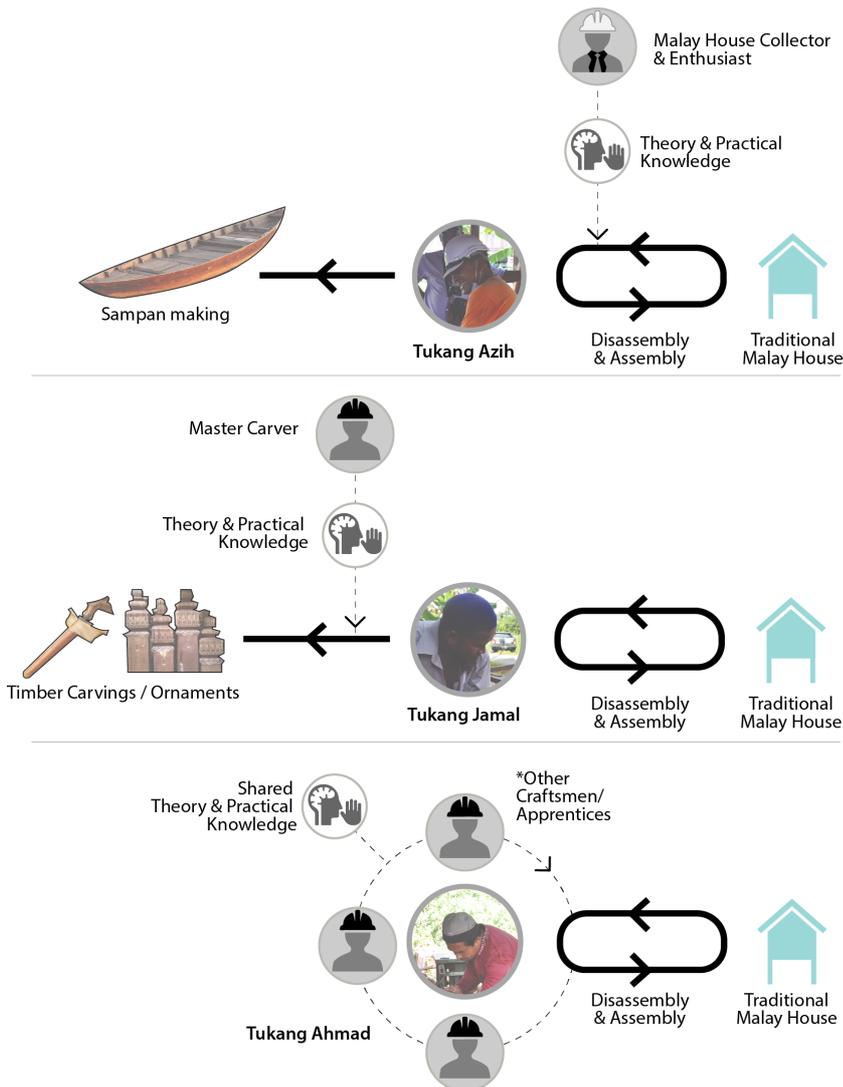


Figure 5.4 *Tukang's source of knowledge, skills and experiences in relation to the Disassembly and Assembly process experienced. Diagram from top: Tukang Azih, Tukang Jamal and Tukang Ahmad. Source: Author, 2018*

This forms part of a wider understanding of the concept of time: past, present and future⁴¹⁶. The past is appreciated for its contributions or reminder⁴¹⁷ which also surmise the claims of inspiration from the *Guru Asal*. The present - as this study tends to emphasise, is for the

⁴¹⁶ Dr. Fauzi emphasised the deliberate aspect of the building culture that foresees disassembly and assembly to occur later in the future, hence the relevance of the 'time capsules' hidden in artefacts. See section 4.6.1.

⁴¹⁷ As Islam is now a primary element within the Malay culture and similarly in Malay house-building, a *tukang* whom a Muslim could resonate with the verses of the holy Quran that signifies the importance of learning from nature and historical artefacts. It is owed to the conservation of 'derelict landscapes, remnant buildings and ruinous structures,' so that they 'serve as a reminders and education for future generations' (Ariffin, 2013, p. 67)

experiences and knowledge gained at a particular moment, while the future accommodates interpretations in return for hopes and aspirations. The primary outcome is the continuation and development of Malay building culture at present.

The depth and richness of interpretations and the cultivation of discussion is instrumental, however, the oral traditions practised was said to be the main obstacle to the preservation of building culture⁴¹⁸. While this is the case, key concepts of Malay traditional culture have survived throughout different colonial periods⁴¹⁹. Although this suggests that the building system is adaptable, it also reveals that the development of the knowledge and dexterity of local Malay crafts people has and could change over time. Hence the reliance on oral tradition may only be a minor hurdle.

Nevertheless, it could be argued that through this variation in perception, apprentices have the tendency to extend the origins of Malay craftsmanship such as in the teachings of Hinduism, Buddhism or animism and beyond the introduction of Islamic beliefs. The root of these traditional concepts, though often irrelevant in modern times (and currently considered a taboo in Islamic teaching) is arguably important to understand the development of the design process, especially in the form and the manner it has evolved⁴²⁰ to provide references in future developments.

This becomes the framework of the interpretations that apprentices should consider, apart from having the tacit experiences that contribute to the explicit knowledge and skills acted. Perhaps it is fair to correlate a Malay *tukang* with the notion of Muslims who memorise verses from the holy Quran in their commitment of safeguarding sacred

⁴¹⁸ Alex described the disadvantage in oral means for knowledge transfer in section 4.5.1.

⁴¹⁹ This is due to the flexibility of the Malay house. It has not only survived in its traditional form, but has been interpreted and amalgamated with different colonial preferences and material advancements such as the introduction of sawmills and brick. More importantly, the concept of building using *tanggam* system, the sustainable ethos and traditional practices it enshrines, have remained part of the construction technique until the present.

⁴²⁰ This is evident in most of the carvings and staircase elements of Terengganu houses that have evolved to portray elements of nature after the arrival of Islam. Refer section 4.3.3.1

knowledge⁴²¹ for present undertakings. However, while Quranic scriptures are believed to be eternal, *tukang's* attributes and the building culture changes, adapts and progresses. Hence the aspect of interpretation of tacit and explicit in the practice and its meaning should progress through time as the meaning in the building culture is now defined by the present apprentices themselves.

5.3.2 The modular Malay dwellings

The *buka pasang* or disassembly and assembly process in the Malay building system is a direct manifestation of the lifestyle within the Malay culture in the past. As social aspects change, it is anticipated that the current notion of disassembly and assembly differs from the initial intent - from the relocation of a house due to spiritual beliefs or environmental considerations such as natural disasters, towards trading and conserving them as reusable 'antiquity' at a high value. In the past, disassembly and assembly was meant to accommodate cultural necessities, and provide flexibility for growing nuclear families, thus the house has the ability to expand, scale down and be relocated.

Depending on the timber used, the house could be considered ephemeral, as it is prone to termites and decay due to weather, even when teak is employed. However, the Malays may have expected that some components could have wear and tear, thus the building system, permits these 'additions and alterations' and as a result, prolongs the life of the house. This may be a common sight for traditional Malay houses adopting less durable timbers usually in other states such as Melaka and Johor⁴²².

The change in purpose can also affect the functional use of the spaces, which may change from a dwelling into a museum. However, while the house *semangat* or 'spirit' of a house changes, the technique remains the same in that it follows the procedural and order (or *tertib*) in disassembly and assembly. The timeless methods of *tanggam* using tenon and mortise joints, fastened by timber wedges is a pre-requisite to

⁴²¹ Ariffin (2013) explains the term of *hafiz* as a person who remembers Quranic verses. The word *hafiza* contains a broad meaning as 'to guard, preserve and keep (verb)' (Ibid, 2013).

⁴²² For example, the Melaka and Johor houses use Kempas wood often, which is less durable than *jati* or *punak* (variations in teak wood).

the findings within this study as it provides the justifications that the house remains rooted to the practice of the past. Consequently, Malay craftsmanship is embodied within the physicality of the house, thus becoming the basis of the concept of 'discovery'.

In this section, the traditional Malay house is argued to foster the discovery of intangible knowledge heuristically through the disassembly and assembly process. It promotes reflective learning of Malay house-building by contemporary *tukang* or apprentices. The simplicity of the construction process of the house, its capacity to be replicated, its flexibility to adapt, its promotion of cooperative values, and its embodiment of local rituals, culture and practices reflecting the lifestyle and belief of Malays, are all qualities of the 'disassembly and assembly' system which affords the exploitation of knowledge discovery, passed down from one generation to the next. This knowledge is made possible by the following traits.

5.3.1.1 Affordance in Simplicity

The techniques of building the Malay house, employing timber wedges and *tanggam* system, are straightforward and repetitive, therefore are generally similar throughout most Malay houses. The building concepts are only limited to horizontal and vertical planes and thus reduce the amount of structural elements required. Apprentices can employ their understanding of the fundamental techniques of Malay house-building in the disassembly and assembly process although it takes years to master new construction. This is important for apprentices as understanding the concept is pivotal in the traditional building trade.

Unlike the heavy and permanent Western timber buildings or the complexity of Japanese traditional building connections, which also includes the practice of reconstruction or reassembly⁴²³, the traditional Malay house is distinct as it allows for constant sporadic improvements to be made and requiring fewer builders⁴²⁴ to build due to its

⁴²³ It was a tradition in some Japanese architecture such as the Ise Grand Shrine to be reconstructed every twenty years to purify the site, replacing the old with new materials and revive their traditional craftsmanship.

⁴²⁴ In addition, it was also recorded that the owner of the house will maintain the house themselves, suggesting that they were part of the building participants themselves.

component-based construction. Therefore new apprentices are capable of experiencing multiple facets of the building process. Moreover, the simplicity of the house makes it easy for new Malay apprentices to efficiently manage the building process themselves, and to record or learn the procedural construction process physically.

Though the concept is simple, the Malay house requires precision in the making of components, as the structural system is interlinked and dependent on every component made⁴²⁵. The structural posts and beams, though self-supporting, are strengthened by the wall panels installed, therefore diagonal structures are unnecessary. Indeed, the physical perpendicular form of the architecture and the obvious interlocking systems makes it effortless to understand the relationship between building components, the functionality and spatial layout. With a general knowledge of the Malay culture, the built and spatial concepts of the Malay house could be known. Justifying the correlation in the tacit and the explicit knowledge portrayed.

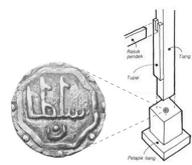
5.3.1.2 Flexibility and Reproducibility

Another characteristic of the traditional Malay house is the flexibility of its form and building details. Since the *tanggam* joinery system is well established in Malay house-building, the house can be adapted to meet the household's physical needs and spatial requirements. Using the same construction technique, the traditional Malay house can be constructed as a multiple-post house or even developed into much larger forms, such as palaces. The traditional Malay *tukang* adopted their own measurement systems using parts of their hand and body, and accordingly, the proportions of a traditional Malay house were derived from anthropometric measurements of the housewife, which is a key ritual. This provides historical evidence of the inhabitant's cultural distinctiveness as well as the building principles adopted by past Malay *tukang*.

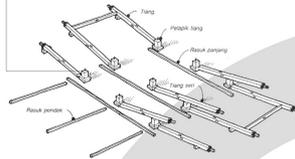
⁴²⁵ Fauzi claimed that these precisions in the built quality were the main rationale to the house durability in terms of structural and environmental impact even after conducting disassembly and assembly. Hence the justification for components to be constructed precisely and without flaws.

The graphic illustrates the disassembly process of a Malay house and the tangible elements in relation to its intangible evidence.

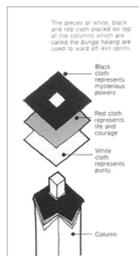
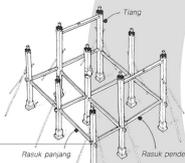
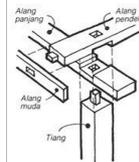
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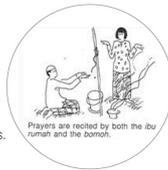
7. Time capsule
As part of the many rituals, gold or silver coins with specific year when the house was built were placed below the stilts column. This itself establish a 'time capsule' indicating the period in time the Malay craftsmen lived.



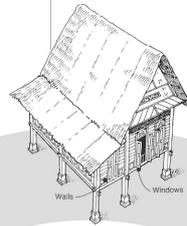
6. Connection techniques.
Malay craftsmen adopted a connection system using timber wedges and tanggam to accommodate the modular and prefabricated nature of the house.



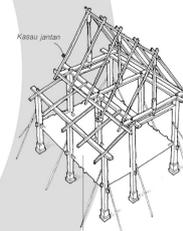
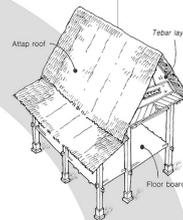
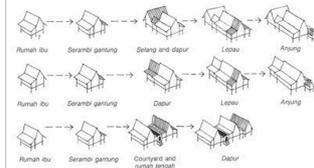
5. Rituals and belief system.
The spiritual relationship dominates the Malay world and is embedded in the process and physical element of Malay housebuilding. Rituals were conducted to please the spirits and for well-being of the occupants. Physical elements are evident in certain features of the Malay house.



1. Form & Styles
The variation in form and styles predict location, cultural inclinations, social status and dialects of craftsmen. There are at least six regional variations existed in Peninsula Malaysia alone (Lim, 1987).



2. Order and space
Malay house develops with its occupants, hence the Malay craftsmen had technical expertise in structural and joinery system to accommodate additional space making. Types of additions are as follow;



3. Measurement system
Malay craftsmen adheres to strict measurement system; (1) magic measurements - used to determine luck for a house and (2) constructional measurements (Arriffin, 2000). Both are based on the local 'Depa system' derived from craftsmen anthropometry and ergonomics.

Normally the Malay house proportions were obtained from the dimension of the women of the house hence the term 'Rumah Ibu' was used.

4. Assembly system.
Malay houses were fabricated and assembled from multiple components and thus requires an assembly system. Every traditional Malay craftsmen have their own techniques or symbols and sometimes engraved onto the texture of the timbers.



Images Ref: Author, 2015

Figure 5.5 Disassembly and Assembly and the speculative findings of intangible from the tangible. Source: Author, 2013

As a result, the flexibility and adaptability of traditional building systems promotes regional expressions of the traditional Malay house in terms of style and cultural necessity. Construction techniques are adopted throughout different regional houses with variations in ornamentation and configurations of building elements. While the traditional Malay houses on the west coast of the Malay Peninsula are derived from Thai

influences, houses in the southern region have influences from an ethnic group derived mainly from West Sumatra in Indonesia. New Malay apprentices could exploit the different styles of traditional Malay houses to express cultural differences, transformations and narratives, describing the development of Malay society from different regional contexts.

In present practice, used timber from various sources, types and different house styles are salvaged - usually from abandoned traditional houses. Due to the unique quality of these timbers, it is common to combine them to form a singular house⁴²⁶, thus the study speculates that in the past it was also possible that houses were part of an object of trade⁴²⁷. Land was a precious inheritance in Malay families and thus are seldom sold to others outside the family⁴²⁸, and it may possibly be that houses or their component parts were exchanged, therefore requiring relocation. As maintenance is a concern, due to the ephemeral nature of the materials used in Malay building culture, components, especially key structural parts, could be replaced occasionally to prolong the life and function of the house⁴²⁹ or 'passed' on to others if it were found to be beneficial⁴³⁰.

⁴²⁶ This occurs at Terrapuri where Alex (owner) salvaged hundreds of houses of Terengganu style to rebuild and save a few. Refer Chapter 4, section 'Skills and Knowledge Reproduction'. Unlike Fauzi, he sourced timbers from houses of various styles and type, especially from Melaka and Negeri Sembilan.

⁴²⁷ Though this claim may not be agreed by many, however, due to the communal lifestyle of the Malay in *kampung*, it may be possible.

⁴²⁸ Dr. Muhammad explained the difficulty in acquiring a house to reconstruct due to multiple ownership of the land, which eventually confer upon the house. Refer section 4.6.3.

⁴²⁹ Ariffin (2001) describes the use of *kolong* or underneath space above the raised floors of Malay houses to store timber materials as spare parts intended for occasional repairs.

Alex also describes the practice of constant upkeep of the house in the use of timber wedges. Also see Hilton (1992) in his explanation of *baji*, a Malay term for timber wedges.

⁴³⁰ Carvers were said to remove a portion of timber from the component of a house for their masterpieces, as the wood had matured and contains *semangat* (Noor and Khoo, 2012). Dr Fawaz recalls the practice of Nik Rashidin to reserve a timber for multiple years for it to mature before undertaking his carving works.

5.3.1.4 Cooperative Values in Malay Culture

The process of building a traditional Malay house requires participation between a Malay *tukang*, his apprentices, as well as the involvement of the village community with various roles and tasks undertaken at different stages. The initial stage of erecting structural timber posts is laborious and requires manpower from village communities coming together in a construction ceremony of erecting the main structural posts (*tiang seri*). This explains why in the past almost all able-bodied males were likely to be *tukang* in one form or another.

Such a tradition of community involvement manifests a building culture that was intentionally bequeathed to the next generation, providing them with a foundation in applied knowledge and other means of sharing skills in traditional building. This is depicted in the disassembly and assembly process during the ceremony of erecting the *tiang seri* or the initial column on site. Therefore, a traditional Malay house is readily accessible and was meant for new Malay apprentices to exploit and acquire knowledge from.

The rootedness of new Malay apprentices within their own culture provides an advantage while working and observing with traditional structures and the built process, by allowing them to apprehend the procedural methods and rituals in Malay house-building. The construction practices and the built-form of traditional houses reflect the culture and spiritual belief system of the Malay people. Therefore the process of disassembly and assembly is a familiar process for new Malay apprentices or anyone who appreciate and practises the Malay culture. This is due to the fact that Malay customs are depicted on key features of the house, such as the orientation towards the Qibla⁴³¹, organisation of space to demarcate the male and female area and the symbolic meanings of each ritual that resonates with Malay beliefs.

The inseparable association between Malay culture and the house-building process suggests that this intellectual endeavour forms a basis for a direct understanding of the phenomenology in the Malay building trade practised in the past. As such, the association new apprentices have with the history of their own Malay culture has transformed the

⁴³¹ It is the direction that should be faced or oriented when a Muslim prays during prayers.

traditional house into a sensible source of past building knowledge. Thus the study postulates the disassembly and assembly of a Malay house as an example of a composition and reflection of knowledge where each of the building elements and procedures is embodied with information awaiting discovery.

5.3.3. Performing and Learning Through Apprenticeships

Fundamentally, the study defines the Malay house as an artefact that could potentially be a valuable source of knowledge (and eventually a basis for developing skill-sets) for an apprentice. In short, it contains a framework that could be made similar to the process of apprenticeship-style of learning. That being said, the study posits that the Malay house is considered as a conceptual object that has meaning to humans - tacit and explicitly - worthy to be conserved and understood. Therefore, the disassembly and assembly delivers a process to extract these meanings, including knowledge, ideas and design philosophy from a physical traditional Malay house. The intent is to promote the discovery of information relating to its property and embodied information where the actions within the disassembly and assembly process affords this discovery, hence this process is the primary proponent for an apprenticeship-style of learning to take place.

The apprenticeship-style of learning in the disassembly and assembly hypothesised in this study begins as a process with a known artefact (the Malay house) and working in reverse to understand the construction and procedure which aided in its development. This is conducted by understanding on how the building mechanism works⁴³², by taking a Malay house apart, measuring it and making sense of what each building components does. Moreover, the study implies that contemporary apprentices, particularly the Malays⁴³³, may have already grasped the fundamental concept of Malay culture and to a certain degree the Malay build technique. Therefore, the process of disassembly and assembly should be reflected as a discovery beyond the physical understanding

⁴³² A few conditions that are required to achieve this 'reflecting' state: (i) It only works on an existing artefact; (ii) design and constructed by someone else; (iii) to understand its essential characteristics and quality, and (iv) to make sound judgments from the knowledge discovered.

⁴³³ As the demographic of Malaysia has changed, this also implies to Malaysians who understand and appreciate the Malay culture.

and towards the non-physical and social or the immaterial and poetics aspects of the building culture.

In the Malay building culture, the notion of disassembly and assembly presents the opportunity to capture various but specific data from building components of the house such as form, texture, size or geometry and other related facts. This is a consequence from the lack of existing house blueprints, hence the relevance of disassembly and assembly highlighted in this study. As mentioned in section 2.4.2, blueprints are scarce and often non-existent in Malay building culture⁴³⁴ owing to Malay *tukang* relying on their inheritance in the form of oral accounts, intuition and bodily experience. Therefore, it posits that the process of disassembly and assembly is an initial attempt to recapture the physical specifications or blueprints of the Malay houses, for it to be embodied in the minds and body of apprentices. It is not meant to reproduce documents or 'measured drawings' per se, but the account in which an apprentice uses his cognition to acknowledge existing patterns or esoteric elements from the Malay house examined.

At present, the disassembly and assembly process occurs during the conservation activity performed by *tukang* and apprentices. It is evident that they understand the extent to which these Malay structures could be dismantled or put back together efficiently and without damaging the components. Though it was reported in the fieldwork that some *tukang* have vandalised the components in the process of taking them apart⁴³⁵, generally they are capable. Hence the disassembly and assembly, aside from the tangible and physical actions of *tukang* and apprentices, it is a step towards providing additional values by recapturing the intangible through re-enacting the poetics of Malay house-building involved physically by apprentices.

The thesis presents several stages with various approaches in conducting disassembly and assembly as a process that could complement the

⁴³⁴ Dr. Syed described the distinctive case of Istana Sri Menanti, a traditional multi-storey timber palace in Negeri Sembilan to have submission drawings due to its period during British rule.

⁴³⁵ *Tukang Azih* reported the difficulty of disassembling the roof structures of Terengganu-style houses, hence some had failed and damaged the structures. Similarly, *Fauzi* described his decision to cut the lower beam of a Malay house in order to disassemble it, as the timbers were bizarrely installed. Refer section 4.6.3.

apprenticeship-style of learning. In general the disassembly and assembly performed by an apprentice should go through these following stages:

- i. Analysis of the Malay house in its physical and non-physical state,
- ii. Producing multiple inception of the house descriptions⁴³⁶ in a form of memory relating to mind and bodily desposition,
- iii. *Apprentices'* collective memory and analysis of the Malay house to produce a specification of the house examined, and of previous houses disassembled and assembled, and
- iv. Re-using the same knowledge and skills gained from previous disassembly and assembly process by repeating stage (i) or producing a new or improved 'artefact' using the specifications extracted and analysed, either in theory or practice.

The initial step in analysing a Malay house requires an apprentice to identify the considerations that define the essentials of the house's original designs and factors that establish this originality. Secondly, to understand the characteristics of the Malay house, apprentices should consider these different specifications. Firstly is the functional that is related to the technical performance, configuration or structural properties of the building system. Secondly is the dimensional specifications – the size, length, spans and height of the house and its parts. Both of the specifications mentioned derive from an apprentice's explicit knowledge of the Malay house. This is purely based on the physicality in form and characteristics of building components. In addition, what is required (and often overlooked) is the consideration of tacit knowledge or the immaterial qualities of the house. The rich cultural evidence of Malay building is thought to be transpired from the rituals or any hint of traditional ceremonies performed.

The subsequent phase of disassembly and assembly relates to the aspect of *apprentices'* collective judgments or analysis from the tacit and

⁴³⁶ This is mentioned in section 2.4.5 of reverse engineering as 'description' or 'product description' to explain the detailed account of interpretations and explanations from the findings, be it in the form of oral, written or cognitive understanding. In customary account of disassembly and assembly conducted by *tukang*, the study hypothesizes the process as an unconscious state of mind that was never justified formally.

explicit understanding of the house, performed at that particular period in time or from the experience of interacting with previous Malay houses. Contemporary Malay house observation follows the structural hierarchy of disassembly and assembly from the macro to the micro level. The procedure begins from the house as a complete form until further dismantling of building components is not possible. This process investigates the intricate details of the house such as the *tanggam* connections, marking systems or any other ritual objects found. Thus the analysis derived from the findings should be a reflection of thoughts on the knowledge and skills of apprentices.

As a result, performing disassembly and assembly is thought to be a form of apprenticeship-style of learning for the apprentices. Though the study argues that it was already imbedded within the traditional building culture, it has to be performed in a manner of traditional Malay apprenticeships; where genuine intent or *ikhlas* should be made priority. Nonetheless, the outcome from gaining knowledge and skills in Malay-house building is intended for a duplicate or a surrogate version of vernacular structures. While the former is the process of creating an original form of a Malay house replica, the latter is meant for apprentices to overcome existing shortcomings and improve the traditional building methods to reflect contemporary culture or technology. The postulation is analogous to the past practice and apprenticeships within Malay house-building that was a consequence of 'trial and error' or a repetitive rehearsal in the development of techniques and form, through the process of disassembly and assembly. That being said, the study argues that contemporary performance of disassembly and assembly should continue this evaluation of trial and error in order to reconcile with modern practices and building techniques. Nonetheless, the study is mainly concerned with the desire to acquire past legacies in the reproduction of knowledge and learning of present and future apprentices.

5.3.3.1 Intent and Cognition

Apprenticeships in the past were reliant upon the apprentices' sincerity and interest in mastering the traditional building trade. Although the building trade was normally an entrusted inheritance as it was family

oriented, however, it is evident that it could have occurred otherwise⁴³⁷. Similarly in the learning process through disassembly and assembly, the apprentices should believe that it was passed unto them as part of their responsibility in the legacies of their own cultural significance. Where the responsibilities of past apprentices were to continue their family trade, present apprenticeships seek to contribute in the continuation of a dying building culture as well as in the development of a building system that is inherently relevant in modern techniques.

Parallel to traditional apprenticeships, performing the disassembly and assembly is argued not only to perfect the performance in house-building knowledge and skills, but perfecting the personalities and worldview of the apprentice himself. Apprenticeships in the past are inclined towards moral and social consciousness and in the same way within the Malay society, moral values such as *Adab* are among the qualities preached and exercised. It is also associated to one of the many attributes of a master *tukang* discussed earlier. Accordingly, personal characteristics of apprentices are formed through the discipline and strict procedural performance of the building culture pertaining to the disassembly and assembly.

Disassembly and assembly demands being conducted with an honest mindset, as in the honesty in Malay religious custom, Malay craftsmanship or workmanship and the visual characteristics of the physical Malay house itself. While the principles of apprenticeships such as honesty, respect, obedience and hard work was formed through the relations of a master and apprentices through the disassembly and assembly, it is to a greater extent via the interaction with the artefacts and the actions performed. This recalls the concept of *Guru Asal* that is symbolically depicted between the relationship of *tukang* with artefacts and Malay heritage. In addition, the study advocates that the interaction with other apprentices is now more than ever central to the revival of the building craft in order to revive the 'community of practice'. The recitations of prayers and the *petua* must be re-enacted and reflections of findings through disassembly and assembly is performed collectively for the apprenticeship-style of learning to occur simultaneously. It is then that the worldview of the apprentices (and its future outcome)

⁴³⁷ It was discovered that during the fieldwork, most of the offspring were never interested in continuing the legacy of their forefathers due to economic and social reasons.

could be formed by reconciling collective decisions from the discovery of tacit and explicit materials.

The wisdom of apprentices attempting to reconcile the 'discovery' captured is challenged and has to be improvised. There will be issues of unknown elements normally related to the immaterial qualities of existing Malay houses. Therefore, understanding and reflecting both the tacit and explicit knowledge in Malay building culture is of great significance, prior and during the performance. Obtaining knowledge and skills requires apprentices' intuition in the form of imitative practice apart from the vocational-style of training gained through disassembly and assembly, that is often mundane and repetitive. Eventually, it is for apprentices to organise and strategise their own learning process, in like manner of the demand within the apprenticeship-style of learning.

Therefore, it is necessary for apprentices to contextualise the building knowledge and skills prior to disassembly and assembly, as it is insufficient without understanding the technical attributes as well as the immaterial and social background of the house being explored. In the opinion of the study, it is acceptable to make modifications to any knowledge and skills obtained within disassembly and assembly in order to make sound judgements that does not deviate from the original intent or principle of Malay house-building culture as in a 'reflective practice'. Furthermore, as the apprentices construct the knowledge gained (and eventually the skills), references to other Malay houses, former knowledge, and prior interactions with other Malay artefacts are influential to 'reconstruct', 're-establish' and collectively synthesize the understanding of the original artefact - which is the house being disassembled and assembled. The outcome could be in the physical form or the theory surrounding it, in order to be represented holistically⁴³⁸.

5.3.3.2 Contextualising Malay houses

Malay craftsmanship places a large amount of significance on context. Prior to understanding the technical, immaterial and general background

⁴³⁸ In addition, as suggested by Dr. Fawaz, a Malay house should not be viewed as an individual object, rather in relationship towards the Malay culture, other Malay arts and crafts and more importantly the characteristics and aspirations of Malay people.

of a Malay house, the study specifies three levels of context that an apprentice has to establish and adhere to, within the Malay building culture itself. These are: the context of the house owner or occupants as well as his family, the house, and the site or environment. The involvement of the original *tukang* and the apprentices in regards to their mastery and ability in the building craft is also considered as an addition to these three contexts, as the apprentice must interpret the contexts based on his or her own knowledge and skills when conducting disassembly and assembly for apprenticeship-style of learning to perform.

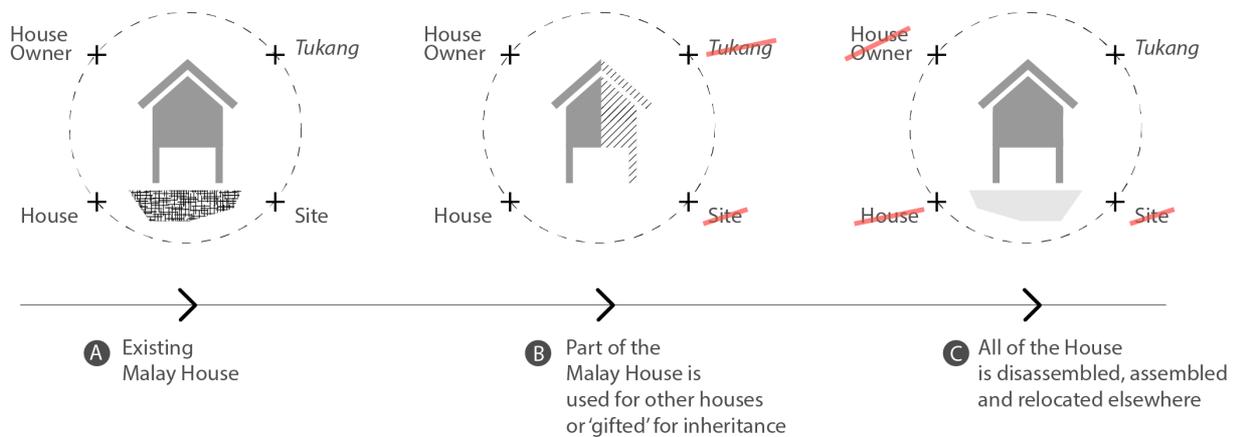


Figure 5.6 Diagram describing the different context of the house based on the phases and the house circumstances. If all of the house (and its parts) are relocated (C), the context of *tukang* ('markings' or quality of building crafts) may still exist -however, the other context may not. This becomes the basis for discovery within these limited context. Source: Author, 2018

Acknowledging the occupants as part of the primary context is crucial as Malay building culture is initiated when the intention to build a Malay house was commanded by the house owner. This initial intention influences the overall characteristics of the house such as the scale, location, size and form, any preferred embellishments, and the engagement of a particular *tukang* they desire. As a result of this, upon his wisdom, a *tukang* could impose certain principles or symbols unto the elements of the house itself.

Subsequently, the context of the house, apart from the workmanship of the original *tukang*, refers to the specificity of the physical dimensions of the house structure in relation to the techniques employed and the style within a particular region. Once the occupants provide the requirements, the *tukang* will provide building specifications in order for

the building process to proceed smoothly. Estimating the number of building components at this stage is crucial in order to estimate the amount of timber required, as a *tukang* cannot afford to miscalculate the necessary materials, procedures and connections required. Additionally, this includes the human and financial resources necessary. In the past, as the process of acquiring building materials could take months, careful planning of the process demonstrates the knowledge, skills and meticulous judgments of past *tukang*'s planning within the building practice.

The next stage is acknowledging the context of resources within the surrounding environment while negotiating between the physical requirements of the house (i.e. materials, tools). This is a crucial part of the *tukang*'s procedure in identifying the *rasi*⁴³⁹ of the occupants towards the house and environment (landscape). In order to fulfill the *rasi*, the house must meet both the needs of the occupant and the surrounding environment, mediating both of these forces in order to come into harmony. This is evident in the process of acquiring the building materials from the forest where a general understanding in rituals of timber selection, mostly influenced by animistic beliefs and partly a personal endeavour of the *tukang*, were practised prior to the introduction of sawmills. The treatment within the procedures, intentionally to please the spirits, were also thought to resemble basic practical necessities in determining a perfect timber suitable through its structural and aesthetic properties to be worthy of a Malay house.

Prior to the assembly of building components, the location of the main pillar (*tiang seri*)⁴⁴⁰ was proposed by the *tukang*, to identify the orientation and location of the house, incorporating the 'context' of the occupant and the environment. This is when both contexts were assimilated and put into use. Therefore the house becomes the mediator or a link between the inside and outside. Adopting both contexts was seen as a belief system that was accepted and practised in the past. Not to forget, the context of the *tukang* himself should also be taken into consideration. However, in contemporary practice, the context is often lost or disconnected when future disassembly and assembly by other than the original *tukang* takes place, coupled with relocation and change of occupants or even building use.

⁴³⁹ Refer section 1.1 (iv) or 2.1.3 for the explanation of *rasi*.

⁴⁴⁰ Refer section 2.2.2 for description and explanation of *Tiang Seri*.

Nevertheless, with relocation, the context of the *tukang*, occupant and the building is still visible within the house itself, thus providing the basis of 'discovery' and learning through the disassembly and assembly process, only limited within those elements. The context of the occupants provides tacit knowledge about their requirements while the context of the house unveils the materiality, technicality and the craftsmanship left by the original *tukang*. The initial mediation between the house and the site context is diminished; however, useful information can still be gleaned.

Let us consider the conservation of the Pahang house as an example⁴⁴¹. The use of mortise tenon joints on the base of the columns and the stone stump recalls the need for a more rigid structural condition associated with its origin or context; a flood-prone area where the house happened to be relocated once further away from the river-banks. This knowledge, if not known prior to disassembly and assembly, may foster a critical reading of the house's condition in relation to its site, though traces of its location may exist. It might further infer that a similar solution was necessary to increase the strength of the house on the ground, whereas generally traditional Malay house columns were directly placed on top of stumps⁴⁴².

In short, a conserved traditional Malay house may be physically lost if separated from all of its contexts in different scenarios, but these contexts can still be present, embedded from the owner, the original house *tukang* (or even from *tukang* involved in the conservation process) and in the properties of the house. Hence the apprenticeship-style of learning could be performed and recreated through disassembly and assembly as a way of acquiring knowledge and skills from existing Malay artefacts. The tacit knowledge acts as a mediator, in order for the apprentices to understand the house and the different ways it could be integrated with the current context. Furthermore, the integration of other 'context' should also be taken into account, mainly the new or salvaged building components from other traditional houses, a common method used for the reconstruction of a single Malay house.

⁴⁴¹ Refer section 4.6.3 and 4.6.4 for the introduction of Pahang house.

⁴⁴² Additionally some may use large overturned clay flowerpots as support, illustrating the ephemeral notion of past structures.

5.3.3.3 The Human Touch

'The practice of phenomenology requires paying close attention to experiencing the encounter with otherness. It involves the sensate observation of daily life, especially those mundane details we feel in our bones but which cannot be readily articulated. This practice reminds me of psychoanalysis where the smallest hint of a reflex action, a slip of the tongue, a somatic experience are never unimportant.'

- Anita Lundberg, 2008

Performing the disassembly and assembly of an existing Malay house is a physical intervention that is connected with human knowledge and dexterity, particularly in its somatic involvement. That being said, contextualising the knowledge and skills should not only be based on the apprentice's prior experience and skills or the cognitive ability to 'reconstruct' knowledge from artefacts. Rather, the study highlights the importance of understanding the intent and intuition of the original *tukang* (or builder) in order to appreciate the knowledge and the skills that are conveyed in the craftsmanship and workmanship of the house.

As any other Malay house was 'handmade' by previous master *tukang*⁴⁴³, his use of materials, crafted form and philosophy is therefore evident. This is due to the properties of the house that were influenced by the very intent of its function, thought up and prescribed by the original *tukang* to be implemented in a certain manner and environment. Therefore the traditional Malay houses are not an arbitrary artefact, but are a product of the Malay culture, conveyed from the preference of house-owner, the *tukang's* ability and the particular society. Hence the disassembly and assembly process is as much a social endeavour as it is technical in nature.

Nonetheless, the relationship between the original *tukang*, the house being disassembled and assembled, and the apprentices is therefore associated, as the study concurs with the idea that the house as an artefact is physical yet transcendent of past mastery and narratives. Physical human presence of the original house *tukang*, for example,

⁴⁴³ This also refers to the knowledge or know-how previously discovered by the original master *tukang*, whom also derives from his previous encounter with his masters and other Malay house artefacts before him.

could be found from evidence in the form of markings on building components, commonly made by chisels, or any ritual items such as hair, gold coins and coloured rags left behind⁴⁴⁴. In the same way, it also demonstrates the immaterial dimension in the notion of *Guru Asal* where apprentices are 'transpired' from the embodiment of a previous human's (ie. master *tukang*) thoughts and actions. Hence, in reference to the Malay building culture, it is impractical to establish an understanding in the findings of Malay house-building culture from the physical 'dimension' alone. Therefore the notion of the *Guru Asal* provides the means towards understanding tacit or explicit qualities from a spiritual standpoint. This is made possible when matrices in the cognitive apparatus⁴⁴⁵ of an apprentice organises his experiences intangibly.

However, dealing with human elements in the disassembly and assembly consequently may lead to the aspect of imperfections on both the apprentice's discovery and interpretations of knowledge and skills. Reasoning and contextualising the information gathered could contain contrasting beliefs or inconsistencies from among the apprentices involved. As disassembly and assembly is inherently a 'discovery' process of previous mastery, which complements the apprenticeship-style of learning, it is therefore expected to contain conflicting ideas⁴⁴⁶. The interactions of apprentices within the disassembly and assembly created a 'decentred' and collective structure similar to the 'community of practices'. Hence, the transmission of knowledge and skills are negotiated and 'recreated' among themselves. By doing so, the diverse opinion of the apprentices could potentially be mutually justified and accepted as well as celebrated.

Nevertheless, the central theme in the aspect of the human touch within the Malay house is the somatic experiences of Malay apprentices. The

⁴⁴⁴ On that account, performing disassembly and assembly requires the attention to minor details where apprentices should avoid obscuring or destroying any valuable evidence leading to the attestation of the origins of the house and its creator.

⁴⁴⁵ The notion is borrowed from Immanuel Kant's version of 'being in space and time' (Branko, 2011, p.81) as matrices, where a person's cognitive apparatus organizes experiences and arrange perceptions.

⁴⁴⁶ This was evident in the fieldwork where *tukang* has contradictory hypothesis in the technical aspect of Malay houses as well as in conceptual notion of Malay craftsmanship. Refer section 4.3.3.2 on Building Skills.

disassembly and assembly process of Malay houses requires laborious bodily participation, which is argued to serve the apprentices as an esoteric dexterity. This somatic experience is then embodied in apprentices in a form of unconscious conduct or bodily disposition, demonstrated from the *tukang* interviewed⁴⁴⁷. To elaborate, the recurring practice of disassembly and assembly, combined with the very nature in the characteristics of a Malay house that is repetitive in its procedure and building system⁴⁴⁸, point towards an understanding and re-enacting of the poetics in Malay house-building, often absent from academic theory. Hence this justifies that while Malay house-building culture derives from the conventions of Malay tradition, it could be 're-constructed' or mimicked by present apprentices where the discovery of embodied knowledge and dexterity of previous masters could be appropriately made congruent with contemporary practice and techniques.

5.3.3.4 Patterns and Rituals as Guidelines

The apprenticeship-style of learning within disassembly and assembly relates to a process where apprentices examine, identify, understand, and discover the 'secrets' of the building trade. More importantly it is for the apprentices to recognise or classify patterns of how the Malay house functions, achieved from their actions and the reflective process, upon when disassembly and assembly is performed repetitively. It becomes a 'script' that guides the apprentices to learn and re-enact the tacit and explicit knowledge and skills by themselves. Similarly in the early stages of apprenticeships, the process is purely labourious and monotonous, which suggests that it is meant to acquire the habit or bodily disposition. Later, the apprenticeship process is substituted by a more reflective practice for apprentices to contemplate on their actions.

This latter part of the apprenticeship employs a cognitive process that relates to the phases of 'deduction, induction and creativity'⁴⁴⁹ or simply

⁴⁴⁷ *Tukang* who have conducted disassembly and assembly on multiple occasions throughout their lifetime claim to have learnt from their experiences and interaction with other Malay structures and patrimonies, hence constantly referred to this detailed conduct.

⁴⁴⁸ See sub-topic 5.3.1.1 of Affordance in Simplicity.

⁴⁴⁹ The author adopts this process which was used to explain the cognitive aspects within reverse engineering, conducted upon artefacts. The Deduction

a process explaining the intent or hypothesis of the apprentices and actions that demonstrate it. Ultimately the creativity relates to the ingenuity of apprentices to interpret and identify existing patterns from their prior experience (posteriori knowledge), believed to be propagated from the disassembly and assembly performed. However, the study posits that the disassembly and assembly process should consider an additional phase to complement the spiritual practice associated with the Malay building culture, as a didactic process. It is often correlated with the aspect of rituals that are performed individually but in a sentimental and collective manner. As Malay houses are influenced by the very intent, skills and spiritual desires of the original *tukang*, rituals provides a medium that traces back the actions of the original *tukang* as well as *tukang* before him - again emphasizing the concept of *Guru Asal*. This is the reason why, though it is considered taboo and superstitious, the study advocates the re-enaction process of traditional rituals alongside the practical actions of disassembly and assembly⁴⁵⁰.

However at present, it is unfortunate that rituals are currently forgotten. Rituals are an important element within the process of building traditional Malay houses. They express the strong associations that local societies make between their emotional, physical and mental co-existence with other forces of life. This mutual understanding of the perceived relationship between man, nature and the spirits is dominant within Malay building culture, which has evolved from an animistic ideology, however most of the physical building procedures have remained the same. Although rituals are neglected in present practice, this study establishes that past rituals work in unison with physical or practical performance in order for the whole building process to be constructed thoughtfully. Accordingly, the rituals as an intangible concept inform the tangible aspects of the construction process, and in doing so, are an example of tacit knowledge being re-enacted in order to address the explicit.

relates to the hypothesis of the apprentices, the induction is the action to bring about facts or prove a general statement, and creativity is the capability of apprentices to interpret.

⁴⁵⁰ Dr. Syed justifies the current re-enactment of rituals and ceremonies in order to bring back the house *semangat* not in the form of summoning spirits or ghosts but as a psychological attempt to invigorate one's inner self, hence to discard the elements of *syirik* within the ritual activities. Other contemporary *tukang* acknowledge rituals only as a symbolic gesture.

Each ritual has its purpose, such as the selection of a site, that requires a Malay *tukang* or *pawang* to conduct a spiritual rite to determine whether the soil and environment is fit to live on and suitable to erect a timber-framed house. The rituals become an important procedural staging post in a lengthy process requiring precision and strategy, from gathering wood in the forest to the assembly of the roof structure on site. Today, the process of disassembly and assembly of something that was so carefully built - procedural and systematic - becomes part of the apprenticeship-style of learning or a learning tool kit for apprentices to rediscover and adapt rituals practised in the past.

These rigorous yet flexible rituals are the key to understanding the tacit or poetics of the building practice, and if lost, they are difficult to recover. Inevitably, the rituals, when conducted within the disassembly and assembly may have been habitual among apprentices without realising the consequences it had on their subconsciousness – in their thoughts and actions in building Malay houses. In short, it is contended that the rituals practised within the disassembly and assembly operate as a system or set of principles, which has already been embedded in Malay building concept of *adab*, *adat* and *tertib*⁴⁵¹. The rituals conducted communally also suggests that Malay building knowledge is based not only on individual memories and bodily skills but on the collective memory of society (in the customs and rituals), particularly those performed during the ceremonial act of disassembly and assembly. Therefore, the rituals and spiritual characteristics of Malay building culture could impersonate and eventually facilitate the apprenticeship-style of learning for the apprentices.

5.3.3.5 Proportions and Time

Another prime example of the tacit knowledge essential to apprentices is the understanding of building proportions. Proportions are commonly defined by scholars and practitioners to relate to the ‘harmony’ between all of the elements within the house-building process, predominantly

⁴⁵¹ *Adab* here is described as a strict observance of etiquette in the actions and thoughts of building the Malay house. The author suggests similar values are present in rituals and *adab*, as both look towards being in harmony with spiritual or *semangat*, while the latter is the oneness of God.

from the visual features⁴⁵². Hence it could also be perceived as 'beauty'⁴⁵³. However the study extends this definition to posit that it also comprises the physical and spiritual relationship between the original *tukang* and the existing house or in the apprenticeship-style of learning between the apprentices and the artefacts. In other words, the wisdom and experience of past *tukang* and current apprentices during disassembly and assembly is part of this 'harmony' and thus establishes the human interactions (in the tacit knowledge and skills) as part of the 'proportion' to be acknowledged as embodied within a Malay house⁴⁵⁴.

A Malay house is a reflection of a *tukang's* skills, style, technique and knowledge, although there is a common standard in the techniques and styles that have been long established within Malay building culture. While the experience of the *tukang* affects both their physical and mental state, the study contends that 'proportions' are related to the mind, body and spiritual integration of a *tukang* (and now the apprentices through disassembly and assembly). These are also embodied within the physical structures of a Malay house that he builds. This concept refers to the embodied tacit knowledge of the original house *tukang* as what could be personified within each of the building components. Hence an apprentice should consider the extent that existing Malay houses conveyed the past mastery or craftsmanship of an original builder or master *tukang*, merely another expression of the *Guru Asal*.

Existing buildings employing traditional Malay elements are often critiqued due to their unacceptable proportions and therefore the theme at play here is the relationship between personal endeavour, know-how, existing artefacts and building tradition. This explains the significance in the apprentice's experience of how existing artefacts are

⁴⁵² See Ariffin, S.I., 2001. Order in traditional Malay house form. Oxford Brookes University.

⁴⁵³ For a Renaissance theorist such as Leon Battista Alberti (1404-1472) proportional relationship of various parts in buildings defines their beauty 'such as that nothing can be added or taken away without changing the building for the worse,' (Branko, 2011, p.50)

⁴⁵⁴ Scholars and subjects talk a great deal about the proportions of the Malay house derived from human anthropometrics, however the study augments that other immaterial characteristics of the original *tukang* or apprentices could also be evident in its rendition, upon when any interactions occur, either in disassembly and assembly for relocation or conservational purposes.

made, and understanding what is the norm should become a critical part of an apprentice's judgement. Therefore, the critique of *keras* (hard) or *halus* (delicate or fine)⁴⁵⁵ in describing proportions is subconsciously made upon visual inspection, and is based on personal encounters and accepted perceptions from the apprentice's activity with Malay houses, particularly from disassembly and assembly, that are not possible for other lay persons.

Moreover, an apprentice - with their esoteric knowledge - can empathise with the extent of skills and knowledge of the original *tukang* from the house artefacts presented. Similar in the apprentice-style of learning, the apprentices mimic the actions and skills of their master, and exercise his visual belief upon acting what is right and what is wrong. Hence the judgment in the notion of *Tukang Alim* or *Tukang Jahil* presented earlier could be established from the visual essence of proportions in the form, thus permitting conjectures about a particular *tukang's* ability or adeptness from existing artefacts. As in the case where exemplary proportions are not abided to, the original *tukang* is said to be potentially ignorant of the aspect of knowledge in indigenous proportions and may be limited in his skills in making. The proportions of Malay houses, therefore are sometimes described as the 'relationship' between different elements, and it is crucially important for apprentices to understand the context⁴⁵⁶ in which the house was constructed.

Another element within the disassembly and assembly is the concept of time, which is often highlighted in regards to its implementation in cultural heritage. Apart from the impermanence of Malay houses that fortifies the notion that passing of knowledge is unavoidable, the concept of time is related to the condition of the house itself. The age of the house, the duration of the 'discovery' and self reflecting practice, is analogous to the phases taken during the apprenticeship-style of learning. The condition of the existing Malay house artefacts and their age influences the way disassembly and assembly is performed, hence corresponds to the timeframe required for apprentices to 'learn' from them. Nonetheless, the modern technique of understanding a physical artefact such as in the reverse engineering, is an example that discovering or learning from a manmade artefact can be made practical

⁴⁵⁵ Refer section 4.6.4. for explanation of these terms.

⁴⁵⁶ Context was discussed in section 5.3.3.2.

and succinct. This is done by taking the artefacts apart and seeing what each components does. Although similar to the 'disassembling' process⁴⁵⁷, reverse engineering lacks in the process of 'assembling' and the immaterial qualities of the artefacts portrayed in the building culture. In reference to the disassembly and assembly of Malay houses, the process could be carried out by an experienced *tukang* or apprentices for only a few days⁴⁵⁸, thus reflecting the brief 'timeframe' the apprentices expectantly could 'learn' from.

Performing disassembly and assembly occurs at a different but sequential period of time. Present conservation practice refers to a process of 'disassembly', prior to 'assembly' and therefore both processes refer to a distinct undertaking. The study suggests that it could have a different set of consequences in regards to the aspect of 'discovery' and learning outcome, whether tacit or explicit. This is due to the distinct processes and conditions of an apprentice's reflective practice that has taken place, where the element in the workmanship of risks⁴⁵⁹ exists in both but with diverse implications. The study finds that in the disassembly process, the element of 'risk' is greater in the aspect of 'discovery', such as hidden artefacts or human markings, hence the emergence of new discovery may be unknown to the apprentices. In contrast, the assembly, which could include necessary reconstruction of certain components, though the risk is lesser and predetermined, confirms the know-how of an apprentice in disassembly, recognising his knowledge and skills in traditional Malay house-building. This is only possible if a similar apprentice conducts both the disassembly and assembly of the same house.

The process of disassembly and assembly, as the study suggests, is a hypothesis to mimic traditional apprenticeships-style of learning. While

⁴⁵⁷ The author speculates that disassembly and assembly is comparatively a reverse engineering of a Malay house separated as twofold: (i) the process during disassembly and (ii) the process of assembly to form the whole structure.

⁴⁵⁸ This is dependent on the style of house and its complexity. Fauzi reported to disassemble a house within one day. However, to assemble it back is normally longer due to necessary repairs and replacements of timber components. Refer section 4.6.6 on the work coordination in conserving traditional Malay houses.

⁴⁵⁹ This is reflected from Pye's (1968, p.20) concept in the 'workmanship of risk'. He describes it as 'workmanship using any kind of technique or apparatus, in which the quality of the result is not pre-determined, but depends on the judgment, dexterity and care which the maker exercises as he works'.

the traditional apprenticeship methods⁴⁶⁰ are thought to be lengthy and time-consuming⁴⁶¹, learning through disassembly and assembly process reduces the time spent trying to understand the building culture as well as the intent of the original *tukang*⁴⁶². Hence considering the opportunity of disassembly and assembly to discover knowledge and dexterity, it can be considered as effective or if not, more efficient than that of traditional apprentices or when a master *tukang* is present.⁴⁶³ Nonetheless, this requires the appropriate methodology as what was formulated on procedures such as reverse engineering⁴⁶⁴.

5.4 Conclusion

*“When the opposites in a duality work in union, there is enrichment and knowledge. If the quest for knowledge is ahead of the action, there is evolution (Mahabharata). If the impulse of action is ahead of reflection there can be destruction. Knowledge informs the act of building, and building widens knowledge.
Knowledge informs the act of building, and building widens knowledge”*
-Anupama Kundoo, 15th International Architecture Exhibition, La Biennale di Venezia

Chapter Five demonstrates that the Malay house-building culture is a form of a spiritual practice that past *tukang* had endeavoured. At present, remanance of spiritual practice remains and superseded with

⁴⁶⁰ Traditional apprenticeship system includes the concept of ‘sitting-in’,

⁴⁶¹ Malay *tukang* apprenticeships were informal and lacking formal institutional structure (ie. guilds system). Hence some subjects reported of their apprenticeships process as unconscious, unwittingly or procedural as it may be seen as occasional visit, only to be ‘aware’ until the ‘master’ is detached from the ‘apprentice’ life. Refer Chapter Four.

⁴⁶² In addition, according to Samuelson and Scotchmer (2002), ‘reverse engineering is able to avoid wasteful expenditures investigating approaches that do not work’. In the future due to advances in technology, we could reduce the costs of rediscovery over time.

⁴⁶³ Having a master *tukang* provides apprentices a direct intervention in their crafts and therefore craftsmanship could be understood verbally or based on direct bodily and visual element.

⁴⁶⁴ The timeframe for reverse engineering in conducting could be reduced and automated such as in software engineering, however the nature of these are distinct from conducting upon a physical entity such as the Malay house.

Islamic beliefs, however the four traditional attributes of master *tukang* discussed earlier remains relevant. This is due to the Malay house-building culture that is both technical and spiritual, hence requiring the ability to communicate wisdom at different phases of the building procedure. Nonetheless, the four attributes of a master *tukang*; a craftsman, carver, Imam and *pawang*, could be made simpler by reducing it to two distinct characters of *Tukang Alim* and *Tukang Jahil*. This again emphasises the traits of a technical practice that is predominantly cultural and spiritual.

Furthermore, the study speculates that the traditional Malay house as an artefact, promotes the preservation as well as the dissemination of knowledge and skills of past craftsmanship through the disassembly and assembly process. The Malay building culture is an embodied experience, hence the heritage and cultural meaning is determined by the people who continue to practice it. This is demonstrated in the disassembly and assembly as it was and still remains as a socially communicative act to disseminate, define, document and conserve the cultural heritage of Malay house-building. The study suggests that at present, disassembly and assembly is a process of re-tracing and re-enactment in the poetics and rituals of Malay house-building by apprentices, parallel to the affair of the apprenticeship-style of learning.

Consequently, the study defines that the Malay house-building culture is in itself a representation in the amalgamation of tangible and intangible (explicit and tacit) in both the artefact and practices. Performing the disassembly and assembly upon a Malay house expresses the intangible cultural heritage relating to the ritual practices, however it also demonstrates the aspects of tangible heritage such as in the somatic and bodily skills of the *tukang* during the disassembly and assembly. Therefore the dichotomy in the general definition of cultural heritage established from UNESCO, particularly of Malay heritage is insufficient and should be defined as an amalgamation of both the intangible and tangible. This presents the opportunity to appreciate the sensual act of disassembly and assembly as a reference to the tacit and explicit inspirations from the artefact as well as in the Malay house-building culture. As such, the phenomenon of apprentices involving with the disassembly and assembly provides an example of how specific knowledge and dexterity can derive from both an artefact and the manner in which its parts are physically intervened with.

Chapter Six.

Conclusion

6.1 Introduction

This chapter concludes the inquiry of the study. This thesis investigated the construction practices of Malay house-building culture, including aspects of intangibility and immateriality, with the *tukang* as the main subject of the enquiry. Presently there is a scarcity of master *tukang* and their practice is at risk due to the lack of demand for building traditional structures in Malaysia. The study hypothesised that the disassembly and assembly of Malay houses – a unique feature within the Malay house-building trade, acts as a facilitator for the preservation of Malay structures, as well as house-building culture. Although speculative, the similarities with the concept of an apprenticeship-style of learning is relevant, and warrants further investigation.

The first section of this chapter reexamines the research objectives in light of the findings and subsequently describes the contribution of the study in regards to the theory and practice of Malay traditional building culture. Section 6.3 explains the implications of the study, particularly regarding conservational practices, and finally suggestions for future study are laid out in order to develop further critical Malay heritage research. The thesis is concluded in the concluding remarks in section 6.5.

6.1.1 Achievement of objectives:

The study had three main objectives. These were to improve understanding of Malay house-building craftsmanship within the past and present, to identify the legacy of past craftsmanship and how it was and is still transmitted, and finally to explore contemporary phenomena in traditional building practice. The following subsection summarises the achievements of the study.

6.1.1.2 Objective 1: Description of Malay craftsmanship

The study concluded that craftsmanship in Malay building culture is rooted not in the tangible built fabric but in the knowledge and dexterity of the building participants, such as *tukang* and apprentices. The study also concurred that Malay building culture is significantly people-centred, focusing on the relationship between people, the landscape and building artefacts. This study further concluded that traditional Malay architecture is ephemeral in nature, which highlights the value of culture, ideas and practice rather than the structures themselves. In contrast to Western architecture, the meaning of Malay craftsmanship is defined by the people and embodied in their practice. This challenges the Western notion of building conservation and heritage policy which often prioritises the artefact over the participant.

The findings from the fieldwork suggest that the apprenticeship system remains the primary approach for traditional knowledge and skills to be passed down from one generation to the next. However, the study surmises that traditional concepts of 'sitting-in' and apprenticeship within a family lineage are being replaced with the modern notion of 'work'. Nonetheless, the ceremonial event of house-building is still a socially communicative act, demonstrating the poetics, ritual and physical techniques of Malay house-building culture to the apprentices as well as building participants within a close-knit society such as the *kampung*.

This study deduces that Malay house building culture is characterised by a dyadic knowledge of the strategic or technical and the cultural or spiritual. The former explains the adeptness in planning and construction while the latter relates to the incorporeal and immaterial sense, typically related to rituals. For this reason, the study regards Malay house building culture as a spiritual practice that connects Malay beliefs concerning religion, mysticism and eventually the notion of *Guru Asal*. In short, it finds significance in the craft processes and the meanings embodied in the *tukang's* somatic actions and the physical structures relating to materials, tools, measurements and procedural building techniques.

As with the western terminology of 'master craftsmen', a *tukang* constitutes an individual, or sometimes a group of people, with unique

abilities, skill-sets and knowledge in the process of making. It is evident from the fieldwork and observations that the four historical attributes of Malay *tukang* – described as a craftsman, a carver, a *pawang* (shaman) or a *ketua adat (Imam)* – are sensible and have therefore endured until the present among contemporary *tukang*. These attributes demonstrate the wisdom or the ability of *tukang* to communicate at a different echelon of the building procedure and relationship. Ultimately, the definition of a *tukang* is modestly described by the terms *Tukang Jahil* and *Tukang Alim*, to denote both the spiritual inclinations and technical requirements of a building practice.

6.1.1.2 Objective 2: Transmission, interpretation and acknowledgement in knowledge and skills

The fieldwork affirms that contemporary *tukang* or apprentices were persuaded by their personal traits, experiences and judgment to embrace the legacy of Malay house building. This process began before they were apprentices or *tukang*, in their experience of *buka pasang* or disassembly and assembly, and their personal endeavours, predisposing an appreciation of Malay craftsmanship passed down through oral accounts, scholarship and encounters with other Malay patrimonies. Contemporary views on interpretations of the craft within the trade are still relevant, as they describe the relationships between the traditional house and contemporary settings experienced by *tukang* and explored within the disassembly and assembly process.

Furthermore, the study found that *Guru Asal*, a way of referencing evidence of past craftsmanship, shows that both technical and spiritual aspects are paramount to the patrimonies of Malay building culture. As such, the disassembly and assembly is defined as a perpetual task and a responsibility inherited for future generations to continue to practice according to customary rituals.

The study has made clear that the process of disassembly and assembly was and is still accomplished as a catalyst in the transmission of Malay house building knowledge and skills. The rituals and procedural techniques embedded within the disassembly and assembly process were examined as a form of guidelines for *tukang* and future apprentices to perform in accordance to the tangible and intangible elements manifested within the building culture.

Accordingly, the study posits that the heritage of a traditional Malay house is better represented as an amalgamation of the tangible and intangible (or explicit and tacit) in both the building artefact and building practice. The house represents the tangible and embodies the intangible, and similarly, the *tukang* and apprentices demonstrate both aspects of tangible heritage, such as in the physical skills, and intangible heritage, in the knowledge and rituals performed. The study warrants that the tangible and intangible or the tacit and explicit are expressed through the act of disassembly and assembly.

6.1.1.3 Objective 3: To explore and understand contemporary phenomenon in the building culture of traditional Malay houses.

The study demonstrated that the act of disassembly and assembly of existing Malay structures is not only a process of reconstructing heritage artefacts but also involves fact-finding about past Malay craftsmanship. The fieldwork conducted hypothesised that the disassembly and assembly process is rooted as an alternative means for knowledge and skills transmission for the conservation of both tangible and intangible Malay architectural heritage, experienced by contemporary *tukang*.

In this regard, the study also suggests that actions within the disassembly and assembly of existing Malay houses affirm the notion of 'living houses' typically associated with Malay structures. Therefore, the study argues that as Malay houses are considered to be 'living artefacts', performing disassembly and assembly should be regarded as a potent action in reanimating this concept – the houses are heritage artefacts that can continue to be explored rather than kept as museum antiquities, while interacting with the artefact acknowledges its cultural values through performance. The study asserted that disassembly and assembly affords a sense of retracing footsteps of past Malay craftsmanship as an embodied experience for apprentices to explore physically and intellectually.

Therefore, the disassembly and assembly process provides the medium for the embodied experience of the building culture to take place, in line with the notion of 'bodily disposition' within a practice. Causal learning, hypothesis testing and reflection by contemporary *tukang* occurs consciously or subconsciously through the process of disassembly and

assembly. Similarly, the study established that this direct involvement with Malay house artefacts and the procedural building technique of disassembly and assembly demonstrates the process of learning and mimetic actions portrayed within traditional apprenticeships. The study emphasised, however, the importance of corporeal and spiritual conditions within the apprenticeship-style of learning that are considered pivotal to the transmission and perseverance of Malay building traditions.

Both contemporary *tukang* or apprentices as well as historians and heritage experts have a part to play in conserving practice and the building trade of Malay craftsmanship. The study agrees that equal emphasis should be given to the practice of traditional Malay house building and its assimilation within contemporary built form and industry. Moreover, the study demonstrates that the definition of meaning in Malay house-building culture should primarily reside with contemporary *tukang* and their apprentices, derived from their apprenticeship-style of learning through the disassembly and assembly of existing Malay artefacts. Though this emphasises the role of craftsmen who build and the relevance of the apprenticeship process, conducting a conservation project is a collective effort that also requires the expertise of architects, conservators and scholars in order to provide a holistic understanding of contemporary cultural preservation.

6.2 Contribution of study

The study has contributed to the understanding of both the scholarship and building practice of Malay traditional houses. In scholarship, the study presents the attributes of Malay *tukang* and their building tradition, primarily associated with disassembly and assembly. The study contributes to an alternative outlook on conservation practice by emphasising the tangible and intangible elements that resemble the characteristics of the apprenticeship-style of learning.

6.2.1 Contribution to Scholarship

The study furthers knowledge about the craftsmanship of Malay *tukang*, previously coloured by Western historical preconceptions about indigenous Malay communities and their practices. Nonetheless, the

study is consistent with current scholarship that a *tukang* should embrace at least four attributes; a Craftsman, Carver, Pawang and Ketua adat (Imam) for his craftsmanship to be whole. This is made possible due to the duality of knowledge within Malay building culture, representing the strategic (or technical) and cultural (or spiritual). The *tukang's* ability to communicate tacit and explicit or physical and immaterial elements throughout the house-building procedure is essential.

The study established that the practice of traditional Malay house-building combines both tangible bodily experience and intangible cultural thought, a duality absent in current literature. The study emphasised the relationship between tangible and intangible characteristics of Malay building heritage as an important and inseparable part of this argument – contributing to the progress of Malay *tukang* and apprentices. Again, the study simplifies the attributes into two distinct definitions, *Tukang Alim* and *Tukang Jahil*, that describe the adeptness of Malay craftsmen. These definitions emphasise the relationship with immateriality and the relevance of the concept of *Guru Asal* and *Semangat*, which inform the practice of *tukang* within traditional Malay houses.

The study also reaffirms the general idea that Asian vernacular architecture, particularly the Malay vernacular, is actively evolving, and is constantly being redefined. Meaning in Malay building culture is embodied within traditional artefacts but more importantly within the people and their practice. Additionally, the study contributed to the idea that exploiting traditional artefacts could provide the means for the transmission of intangible traditional building knowledge and skills. Therefore, the study demonstrates that the phenomenon of practising disassembly and assembly is an example of how building knowledge and dexterity can derive both from an artefact and the manner in which its parts are physically and spiritually intervened with.

6.2.2 Contribution to Conservation Practice

The study concludes that the characteristics and outcome of the disassembly and assembly procedure in Malay building culture is akin to the traditional apprenticeship-style of learning. The merits of Malay houses such as simplicity, flexibility, reproducibility, cooperative values, affordance in procedure and the inclusion of Malay representations

facilitates the process of disassembly and assembly. As a result, the study deduces that it provides appropriate conditions for apprenticeship-style learning to take place.

The study highlights that traditional apprenticeships in the past relied on the relationship between a master and apprentice. Moreover, the apprenticeship system is rooted in mimetic culture, pertaining to the physical as well as spiritual. The study correlates this idea to the disassembly and assembly process experienced by contemporary *tukang* that requires constant bodily movement and performance, as well as strict adherence to the procedural sequence of house building – to some extent both a physically active as well as mental endeavour. Moreover, the movement of the building components – taken apart and re-assembled, or vice versa – intensifies this active routine, somatically conducted by contemporary *tukang* or apprentices.

Accordingly, the study views contemporary conservation practices not just as a reconstruction of traditional structures, rather reaffirming this phenomenon by retracing the footsteps of previous master *tukang* through procedural techniques and rituals in disassembly and assembly. The study regards this as an embodied heritage experience, encountered in the physical and mental disposition of contemporary apprentices. Eventually, the study suggests that the value of Malay cultural heritage and the conservation of traditional houses lies not in the static heritage of artefacts, but in the physical interaction between artefacts and people in the present. The loss of knowledge inherent in the decline in *tukang* and traditional building practice may be countered through the disassembly and assembly process.

6.3 Implication Of Study

The study suggests that the conservation of Malay houses should consider the participants involved as equal to the building artefacts. The study views disassembly and assembly (a process that reflects the values of a traditional apprenticeship-style of learning) as a strategy to pass on knowledge and skills in Malay house-building culture. In addition, the study established that disassembly and assembly requires physical and intellectual involvement as well as technical and spiritual participation, which requires intent, prior knowledge and the skills of apprentices. In order to achieve an apprenticeship state-of-mind, causal learning and

contemplation is required to acquire a complete understanding of Malay building culture. The study implies that conservation should be explicitly planned and recorded, specifically in the intrinsic disassembly and assembly process. The aim, underlined in the study, is to promote the continuation of Malay house building culture through knowledge discovery and cultural reproduction.

Secondly, the study reconsidered the dichotomy in the notion of Malay tangible and intangible cultural heritage. The somatic involvement of *tukang* within the process of disassembly and assembly portrays both the tacit and explicit, the immaterial and material, and the intangible as well as the tangible. Therefore, both the physical act and the thought process induced by contemporary *tukang* or apprentices during the disassembly and assembly process establishes the meaning of Malay heritage. While existing physical artefacts such as Malay houses remain important, the study concludes that enlivening the rituals and building techniques contributes greater significance to the physical artefacts themselves.

6.4 Recommendation For Future Research

This ethnographic study revolves around the idea of vernacular and cultural heritage, people and their practices and the passing of knowledge and skills relating to it. In this regard, the study presents three recommendations for future research concerning these corresponding topics. Firstly in the aspect of vernacular architecture which highlights that the Malay traditional house is a progressive building system that requires resurgence within contemporary setting through both tangible and intangible idea. Secondly the recommendations refer to the practice in the house building culture and how the idea of 'performance' of heritage artefacts presented in this study could be replicated on other cultural heritage practice. Finally, the study recommends that other means of knowledge and skill transmission to be investigated further – example relating to oral such as songs or poetries – to be incorporated in vocational studies, either in physical, visual or digital.

The traditional vernacular architecture in Malaysia has a lot to offer to the contemporary setting. The study highlights that the construction system in Malay traditional houses, particularly the *tanggam* is a critical

element that should be emphasised in the study of Malay traditional houses. This study suggests that vernacular Malay architecture is not about the physical form and that the *tanggam* not only to be considered as a building system, but a complete system that facilitates the *buka pasang* or disassembly and assembly as well as the other values of Malay vernacular that leads to the progress in technical and cultural. In spite of this, the *tanggam* system is not isolated with the ritual and cultural acts of building participants. Subsequent studies should view the vernacular way of building as equal to the contemporary building techniques such as the modular pre-fabrication system that is lacking in Malaysia. However, while the modern system is technologically matured, assimilating Malay intangible house-building qualities will add value to the progress of Malaysia's vernacular architecture.

The study also underlines that the aspect of Malay building practice is enabling the discovery of knowledge and skills, through the disassembly and assembly of existing artefacts. The concept of 'performance' of heritage artefacts presents the notion that heritage artefacts are both an object of patrimony and an object to be physically in contact with. The study suggests that artefact objects should be examined, analysed and sometimes modified in order to appraise and assimilate them in contemporary. Therefore subsequent studies should look towards how this model of heritage could be replicated in other Malay heritage artefacts. The Malay boat-building culture portrays a similar approach to Malay house-building hence should be closely related to the hypothesis presented in this study. Other Malay cultural heritage such as *Kris* making or Malay carvings could also be examined using this methodology, however, should emphasise towards the spiritual concept of *Guru Asal*.

Finally the study suggests that the passing of knowledge and skills through the act of exploiting building components and interaction with people and objects at present, are just one example of how traditional concepts are inherited. Although the study describes a similar approach to the apprenticeship style of learning pertaining to house-building that are based on ritualistic, mimetic or repetitive representations, other approaches such as in oral, songs or poems could have similar influence in transmitting past attributes. These additional scholarships could contribute and add to the objective of this study.

6.5 Concluding Remarks

The study examines the traditional craft of Malay house-building in the present in order to identify the legacy of Malay craftsmanship concerning knowledge and skills of *tukang* and their apprentices. The contemporary Malay building practice and how traditions are transmitted among building participants are explored and recorded. The study advocates for the revival of indigenous practices within contemporary as Malay building practice is diminishing. This results in numbers of master craftsmen declining and the eminent loss of traditional knowledge and skills.

The Malay house-building culture attests to the view of Asian vernacular architecture that is generally dynamic and constantly changing. The significance of Asian vernacular architectural values lies in the culture, identity and meaning from the people who practise them, rather than the fabric or preserved architectural heritage. Therefore, the traditional Malay houses are a manifestation of Malay craft process and meanings embodied in the Malay society and their building practices.

The study is based on fieldworks conducted in Malaysia and adopts the unstructured interviews with the subjects; *tukang*, academics, experts and non-experts. The visual observation methods describe the building activities, mostly conservation projects, in order to provide insights and reinterpretation of Malay house building culture that still survived among the 'community of practice' in contemporary. The methodology adopted is relevant as the craft knowledge and skills remain embodied and are performed, rather than articulated in written or oral.

Tukang is established to have multi-faceted attributes. Notably, *tukang* are more than just builders but have a cultural and spiritual role. The study implies that the Malay house-building is a form of a spiritual practice that connects the Malay cultural beliefs to the Malay house and the building process. Hence, the house-building procedure and rituals emphasise in the value of culture, memory and religious identity rather than purely narrating the structures.

The study concluded that Malay architecture is rooted not only in the tangible built fabric but in the knowledge and dexterity of *tukang* and the craft process relating to materials, tools, measurement and bodily

movement. Hence, the meaning of craftsmanship in Malay house-building is defined by *tukang* and embodied in their practice. Similarly, the values of Malay cultural heritage are considered not in the static heritage artefact, but the amalgamation of physical and spiritual interaction between artefacts and the people, particularly the *tukang* and apprentices in the present.

The primary findings of the study implies that the essence of craftsmanship, knowledge and skills in Malay house-building are portrayed and re-enacted within the actions of *buka-pasang* or disassembly and assembly. The study demonstrates that Malay structures were destined to be manipulated and reconfigured through the act of disassembly and assembly. Furthermore, performing disassembly and assembly remains as a socially communicative act in transmitting building traditions among building participants, including the community whom observe.

Traditional Malay houses are artefacts rich in both tangible and intangible element and thus the disassembly and assembly is considered as a process involving dyadic knowledge of strategy and cultural. While knowledge of 'strategy' refers to the technical and procedural qualities, the knowledge of 'cultural' manifest the rituals and poetics means of house-building. Nonetheless, both knowledge performed during disassembly and assembly emphasised the process of mimetic, causal learning and cognitive process similar to the apprenticeship-style of learning. Therefore the study hypothesises that disassembly and assembly is comparable to a form of apprenticeship, as it afford to an embodied heritage experience and a sense of retracing footsteps of past mastery.

The act of disassembly and assembly, which is readily embodied in Malay house-building culture, is a catalyst in overcoming current shortcomings within Malay cultural heritage. The disassembly and assembly procedure not only serves as a conservation process, however, when viewed as a means of discovery and learning, could potentially be beneficial for the continuation of Malay building legacy in other forms. As a result, the answer to the loss of heritage such as the decline of traditional building practice, the building participants and knowledge it offers, is through the act of disassembly and assembly.

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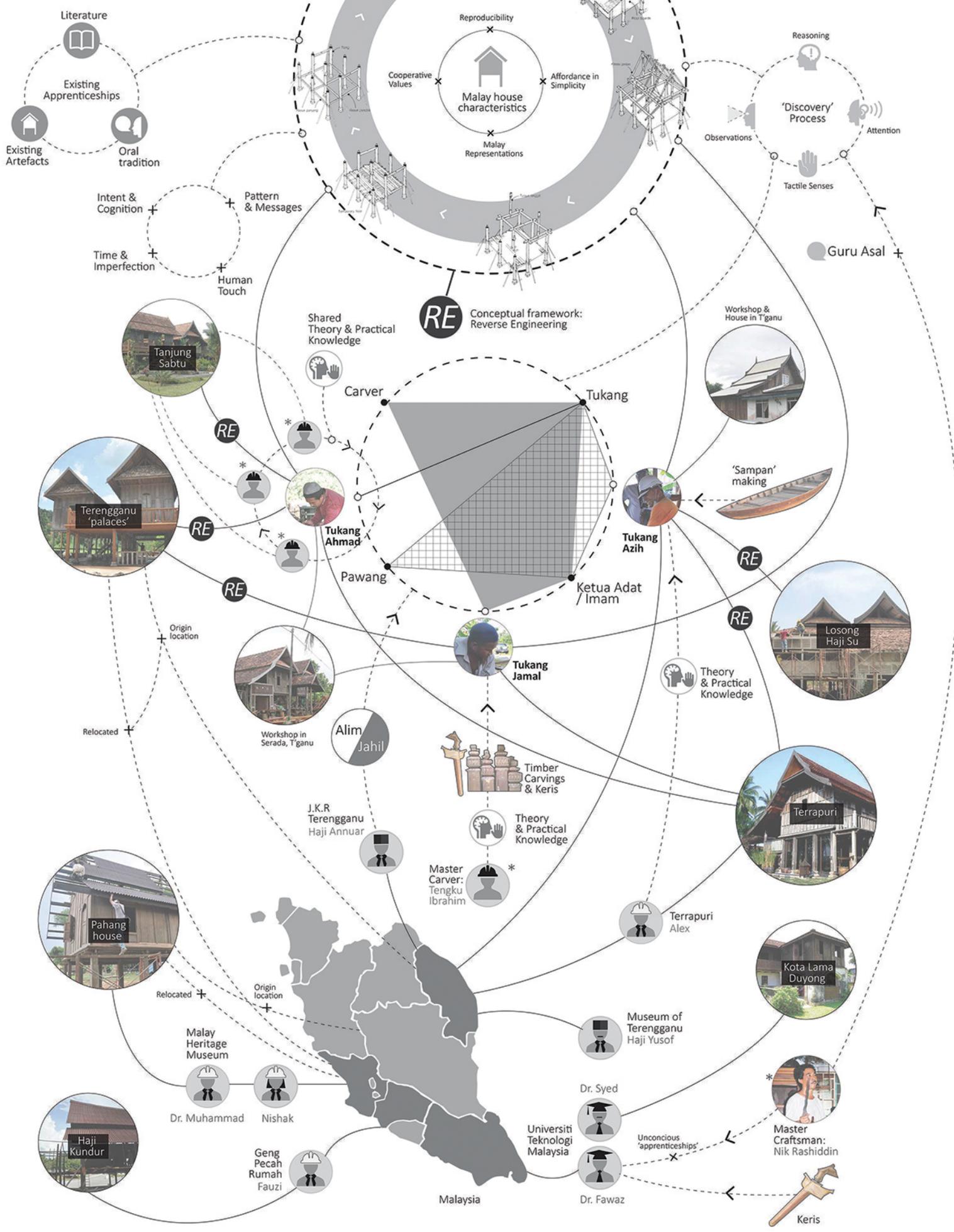
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Appendices.

- i. Aiman M.R. (2016, Sept). 'Alternative Apprenticeship: Disassembly and Assembly in Malay Building Culture', Poster Presentation for Viva Examination, The University of Sheffield, Sheffield, UK.
- ii. Ethics Approval, Participant Approval sheet and Participant Consent Form, 2015.
- iii. Ethics Approval, Participant Approval sheet and Participant Consent Form, 2014.
- iv. Advise letter and reply on the 'The Safeguarding in Skills and Knowledge of Malay Tukang with Regards to the Conservation Project of Kampung Teluk Memali Mosque', dated 1st September 2016.
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- vi. Aiman, M.R., Meagher, M. and Lawrence, R. (2016) Reverse-engineering culture: Recovering traditional craft practices In Malay housebuilding. In: Making Futures. Making Futures IV, 23 - 25th September 2015, Plymouth.
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Alternative Apprenticeship: Disassembly and Assembly in Malay Building Culture





The
University
Of
Sheffield.

Application 006703

Section A: Applicant details

Created:

Thu 29 October 2015 at 13:01

First name:

Aiman

Last name:

Mohd Rashid

Email:

amohdrashid1@sheffield.ac.uk

Programme name:

PhD Architecture

Module name:

Research

Last updated:

17/11/2015

Department:

School of Architecture

Date application started:

Thu 29 October 2015 at 13:01

Applying as:

Postgraduate research

Research project title:

Reverse-Engineering Culture: Recovering traditional craft practices in the disassembly and assembly of a Malay house.

Section B: Basic information

1. Supervisor(s)

Name

Email

Mark Meagher

m.meagher@sheffield.ac.uk

2: Proposed project duration

Proposed start date:
Fri 20 November 2015

Proposed end date:
Sat 31 December 2016

3: URMS number (where applicable)

URMS number
- not entered -

4: Suitability

Takes place outside UK?
Yes

Involves NHS?
No

Healthcare research?
No

ESRC funded?
No

Involves adults who lack the capacity to consent?
No

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial?
No

Social care research?
No

5: Vulnerabilities

Involves potentially vulnerable participants?
No

Involves potentially highly sensitive topics?
No

1. Aims & Objectives

This study celebrates the idea of the Malay craftsmanship in building the traditional Malay house. The traditional Malay house is an architectural blueprint of Malaysian building heritage and its building method such as the 'disassembly and assembly' process is part of the ingenious Malay craft that signifies the quality physical trade and artistic endeavor of the Malay craftsmen. Contemporary mass-produced housing and construction techniques have led to the 'regrettable loss of the touch of the human hand' (Pallasmaa, 2009) hence the study attempts to recall, investigate and document this historical value in Malay intangible heritage.

The study seeks to understand this Malay craft by focusing on the knowledge, dexterity and techniques used by the Malay 'Tukang' or master craftsmen in their practices. Apart from that, this study focuses on the aspect of 'disassembly and assembly' method that is part of the building process that has proven to provide a rare and priceless opportunity for contemporary Malay craftsmen to learn the indigenous building system and understand the aspect of the past trade. The researcher will be referring to the issues pertinent to the Tukang's traditional belief system, use of tools, construction techniques, cultural affairs and others.

There are three core objectives as described below;

1. To enquire into the Malay Tukang's craftsmanship (knowledge, personality, habits, techniques and skills) in the process of building the traditional Malay house.
2. To identify the significance and the values of 'disassembly and assembly' process, a technique within the building or reconstruction of the traditional Malay house.
3. To document the persistence of traditional intangible Malay knowledge and craftsmanship within contemporary practices, which is instrumental towards promoting knowledge transfer in the trade of heritage building such as the traditional Malay houses.

2. Methodology

The investigation into the traditional Malay craft requires the author to identify the values, skills, techniques and practices of a Malay Tukang from the perspective of both traditional and contemporary practices. Available literatures on the topic of traditional Malay houses or Malay Tukang were mostly descriptive and lacking the intangible cultural heritage aspect hence by adopting an ethnographic methodology, the researcher could learn, experience and understand the practices of Malay Tukang during the fieldworks in Malaysia.

As an early hypothesis, the 'disassembly and assembly' process; a method often used for relocation of the structures in the past as well as in current building conservation practices in Malaysia, provides an invaluable and alternative resources for knowledge transfers in bridging the gap between the traditional (the building or artefact) and the new (contemporary Malay Tukang). Therefore, the focus of the study is framed towards this 'disassembly and assembly' process with emphasis on the aspects of knowledge and skills that the craftsman had obtained.

Empirical evidences will be gathered by conducting interviews and observations. The methods of the interviews will be based on semi-structured or open-ended interviews in order to acquire the appraisal of knowledge and oral history towards the experiences and abilities of the Malay Tukang. On the other hand, the observations conducted on site while the Malay Tukang are working on their crafts could provide further understanding on the process, procedural techniques and other tacit qualities that the Malay Tukang could not express or describe verbally. This is one of the few problems encountered while researching the tacit qualities of crafts people (Woods,

2009)

References from existing literatures and public perceptions are consistently probed in order to highlight significance in similarities or changes occurred between the past and contemporary. Hence, the outcome of the fieldwork is to understand the values of a building process that are becoming uncommon, development of knowledge and skills of contemporary *Tukang* involved and the impact of traditional artefacts had an influence to these *Tukang*. Generally, the study intends to document, restore intangible knowledge that had been lost and disseminate it within the current cultural and architectural context.

The methods proposed are described below:

1. The Malay *Tukang* or craftsman's actions are studied in reference to their involvement with the 'disassembly and assembly' process of building the traditional Malay. The researcher had identified a few craftsmen whom still practices this traditional trade or had the experience first hand in such activities in the past.
2. Data will be gathered from participants of the building process (mastercraftsmen, apprentices, students, laborers etc.) as well as from expertise (researches, lecturers, conservationist, museum directors and etc.). The sources of data are from existing literatures, participant observations and semi-structured or open-ended interviews. The researcher anticipates that the language used for all the correspondence in the field, will be in Malay and therefore must be translated into English.
3. Data collected are relatively unstructured in order to gather as much information as possible to throw light on the issues related. This is portrayed on the open-ended interview questions proposed. Participants will be called upon with their consent and if working on-site, participants will be interviewed while on break.
4. Equipment such as sound recording devices, camera for taking photos or videos and notebooks will be used during the interview and observation process. All data are confidential and will only be used for the research purposes.
5. Interview sessions may be prompt and spontaneous while the observational process will depend on the length of time the participants are working on a particular project. Therefore, the researcher anticipates to stay or visit a particular site for days or weeks as necessary.
6. Talks or workshops will be conducted (if required) in order to receive feedbacks from the public or specific local community to gather ideas on how the intangible cultural heritage could be disseminated to benefit the masses.

3. Personal Safety

Raises personal safety issues? Yes

Personal safety management

The interviews will be one-to-one and conducted face-to-face within or outside working hours at the participant's place of work or other safe areas. No personal safety issues have been identified for the researchers beyond what would be expected in normal daily life.

However, most of the observations and interviews are expected to be conducted in construction sites and therefore may affect the personal safety of the researcher. The researcher will acquire permission from authorised personnel, must be in the presence or supervision of a member of staff on duty and must wear proper safety attire as stipulated in the safety guidelines available. The interviews conducted will be done while the participants are on break and are not distracted by the machine, tools or work done at hand. Meanwhile, the observation procedure will not be obstructing any dangerous activity and should not intervene the participant's concentration to avoid accidents.

The researcher will attend health and safety training sessions or the 'tool box meeting' on site and must adhere to the safety regulations within the premise. Please bear in mind that the researcher is an architect and had years of experience in the construction field on site and therefore had undergone health and training procedures.

Section D: About the participants

1. Potential Participants

Potential participants are craftsmen working on the construction of traditional Malay structures. These include the master craftsmen, their apprentices and builders or labourers working on the same project. The Researcher had identified the master-craftsmen which will be considered as the main reference for the interview and observation. Additional construction personnel on site such as the clerk of works, architects, contractors and others will be interviewed within a safe environment and not while they are working with machines or equipments. Other participants will be identified during the fieldwork process with the advise of the master-craftsmen and others.

In addition, prominent woodcarvers such as Mr Norhaiza Nordin, Mr Wan Su Othman, Mr Latiff bin Long, Mr Wan Mustafa, Mr. Jamalias Ismail and other expertise within this area of study from different backgrounds such as researchers, lectures or students are potential candidates for the research as they are experienced in the field of traditional Malay architectures.

Apart from that, the researcher anticipates a spontaneous interview and intervention session with other construction personnel such as the clerk of works, architects, contractors, labourers within a safe environment and not while they are working with machines or heavy equipments.

2. Recruiting Potential Participants

The participants will be initially contacted through email with the participant information sheet and consent form attached, this will be followed up with a telephone call a few weeks or days before to make arrangements for the interview and observations.

However, it may be possible that some participants may not have access to emails and therefore a telephone call will have to be made. In some situation that the participants could not be contacted by either email or telephone call, the researcher will have to meet the interviewees in person to arrange for interviews and observations.

Where there are many potential participants within a site, the researcher intends to approach the Architect, site manager or the person in charge to request permission and advise in order to conduct interviews and observations efficiently, without disturbing the building process.

Contacts details for participants are mostly acquired from organizations such as KALAM centre, Malaysia National Heritage Department, The Heritage of Malaysia Trust, Akademi Nik Rashiddin or Malaysian Timber Industry Board.

2.1 Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by CiCS? No

- *not entered* -

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

There will be a participant information sheet, which informs the potential participant about the details of the research and the process of data collection by the researcher. Before conducting both the interview and observation session, all participants will be asked to sign the consent form and be informed that the data collected will be used only for the research. All participants will be informed that voice recording, video recording, photo taking and note taking will be part of the process. In an event where the participants are not able to read the consent letter nor understand it, the researcher will be asked to read the participant information sheet and briefly explain the process of data collection. Participants will have the right to omit part of their information provided from the research as requested. Only with the participants' consent and upon signing the form that the interviews and observations will proceed.

4. Payment

Will financial/in kind payments be offered to participants? No

- *not entered* -

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

The proposed participants are mostly working within the construction sites and may be distracted by the interview and observations conducted. This is due to the fact that the participants may have a certain task to be completed at hand or may not be comfortable being interviewed and observed.

How will this be managed to ensure appropriate protection and well-being of the participants?

The researcher must always remember to request consent from all participants and to inform them the procedures taken before, during and after data collection.

While interviewing, the participants should be on their break and not operating any dangerous machines or equipments to prevent injuries and harm to the participants.

In the observation process, voice, images and videos recording will be taken and therefore the researcher should be in a safe location that does not obstruct nor interfere with the participants' tasks and movements. Equipments will be placed safely at a suitable distance to prevent distraction to the participants.

The researcher will be attending the health and safety training sessions or the toolbox meeting on site and must adhere to the safety and regulations of the premise.

Section E: About the data

1. Data Confidentiality Measures

The researcher will explain to the participants that the interview and observation procedure will be voice recorded, transcribed and later translated into English (if necessary). Cameras will also be used to capture images and videos of the participants and related activities on site if the participants had agreed and signed the consent letter provided earlier. Permission for images and

videos taken on site will be requested in advance from respected authority.

All participants will be reminded that the data collected will be strictly used for the research or its outcomes (public talks, conferences, presentations and etc.) and that data are kept safely and only accessible by limited personnel. Participants can withdraw their own data from the research without having to give reason at any time.

2. Data Storage

All of the data collected will both be kept electronically on a computer and backup disks which is password protected and kept safely with the researcher at all time. Physical hard copies will be stored in a locker at the University, and locked with a key. Only members of the research team (researcher, supervisors or research partners) will have access to data, which has not been anonymized. Data will only be used for analysis and illustration in conference presentations, lectures and not be transferred outside the University without formal arrangements or permission from University departments or participants to ensure that participant's rights are protected. At the end of the study, data will be archived, destroyed and/or removed if it is no longer practical to keep.

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?

Yes

Participant Information Sheets

- [ETHICS_part_info_2015_aiman.pdf](#)
(Document 015237)

Consent forms relevant to project?

Yes

Consent Forms

- [ETHICS_consent_2015_aiman.pdf](#)
(Document 015234)

Additional Documentation

None

External Documentation

- not entered -

Official notes

- not entered -

Section G: Declaration

Signed by:

aiman MR

Date signed:

Tue 3 November 2015 at 17:23



Downloaded: 05/07/2017

Approved: 17/11/2015

Aiman Mohd Rashid
Registration number: 120237621
School of Architecture
Programme: PhD Architecture

Dear Aiman

PROJECT TITLE: Reverse-Engineering Culture: Recovering traditional craft practices in the disassembly and assembly of a Malay house.

APPLICATION: Reference Number 006703

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 17/11/2015 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 006703 (dated 03/11/2015).
- Participant information sheet 1013258 version 1 (03/11/2015).
- Participant consent form 1013255 version 1 (03/11/2015).

The following optional amendments were suggested:

Summary of comments: How many sites are you visiting and where are they? Do these sites present any health and safety issues? How will you maintain contact with your supervisors in the field?

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Yours sincerely

Christie Harrison
Ethics Administrator
School of Architecture



Downloaded: 05/07/2017

Approved: 28/11/2014

Aiman Mohd Rashid
Registration number: 120237621
School of Architecture
Programme: Postgraduate Research Project

Dear Aiman

PROJECT TITLE: The persistence of craft in the knowledge and dexterity of Malay Craftsmen

APPLICATION: Reference Number 000107

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 28/11/2014 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 000107 (dated 27/11/2014).
- Participant information sheet 003713 version 1 (27/11/2014).
- Participant consent form 003714 version 1 (27/11/2014).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Yours sincerely

Email Arc Ethics
Ethics Administrator
School of Architecture

Reverse-Engineering Culture: Recovering Traditional Craft Practices In Malay Housebuilding

By Aiman Mohd Rashid, The University of Sheffield. Mark Meagher, The University of Sheffield.
Renald Lawrence, The University of Sheffield.

Introduction

UNESCO defines intangible cultural heritage as ‘the practices, representations, expressions, knowledge and skills – including the instruments, objects artefacts and cultural spaces associated with them – that communities, groups and individuals recognize as part of their cultural heritage’ (Safeguarding of the Intangible Cultural Heritage 2003¹). This represents a shift from western and museological heritage principles towards an eastern heritage paradigm, which relies significantly on cultural expressions and the role of non-physical heritage. It is by definition people and process oriented rather than artefact or object-centered.

Considering the definition of heritage established by UNESCO, the traditional Malay house could be categorised as a tangible cultural heritage or cultural artefact, while the building process could be described as intangible. Hence, the builder of the traditional Malay house – a Malay Master craftsman or Malay ‘tukang’ – is the bearer of intangible heritage, where indigenous knowledge is passed down from one generation of Malay ‘tukang’ to another.

Knowledge-based heritage such as in the traditional Malay house building is predominant in the built environment within South East Asia and particularly in Malaysia, which is rich in rituals, spiritual beliefs and oral traditions. However as a forgotten trade, Malay ‘tukang’, along with the skills they have inherited, are few and far between, leaving a significant generation gap in the lineage of Malay craft legacy. This has contributed towards a loss of indigenous understanding, know-how and skill in traditional Malay house building.

This paper discusses the findings and opportunities of an undocumented process within traditional Malay house building – assembly and disassembly – in order to revive, learn from, and pass on the workmanship, techniques and narratives of previous generations for new craft practices to take form.

The traditional Malay house

The intangible cultural heritage of a traditional Malay house lies not only in the knowledge and skills employed in its construction but also includes other Malay doctrines, including magical beliefs, religion, culture and sustainability (Lim 1987). Rituals play a major part in the process of building the Malay house, from the preliminary search for building materials to the selection of a site and the final occupation of the house in order to please spirits and other powerful forces. Accordingly, the Malay belief system dominates the construction processes, building rituals and physical forms of the traditional Malay house.

A traditional Malay house is distinguished from other houses throughout South East Asia by features such as its light wooden construction on structural stilts footing and its non-boat-like character. It is identifiable as a typology by its small roofs (Waterson 1997). The basic characteristic of a traditional Malay house lies in its post and beam structure that is determined by the number of structural timber posts. Timber crossbeams to support the floors and pitch roof structures are slotted into the upright posts by mortise joints secured by timber wedges instead of nails. Non-load bearing walls and openings are placed between the structures, additionally increasing the structural stability and rigidity of the house and thus eliminating the use of diagonal structures.



Figure 1: Example of a traditional Malay house in Terengganu with a regional variation of form and style influenced by Thai architecture. This structure was disassembled, reconstructed and restored as a resort building in Terrapuri heritage village.

These characteristics describe a general overview of the many different indigenous shelters built by Malay people across Malaysia, which often possess regional variances in terms of ornamentation, form and space that represent different dominant regional successions. However, for the purpose of this research, the study focuses on the basic traditional Malay house set within the Malay Peninsula, where concepts and build techniques are commonly shared.

The Malays were among the pioneers in modular construction and prefabrication (Hilton 1992), as the building system of traditional Malay houses is capable of being extended, disassembled and relocated elsewhere. It is one of the many unique features of the house expressed by the Malays as 'buka pasang' or 'disassembly and assembly' rather than the term 'building'. Each of the building components in a traditional Malay house can be taken apart in a process that was practiced in response to their cultural needs and spiritual beliefs.

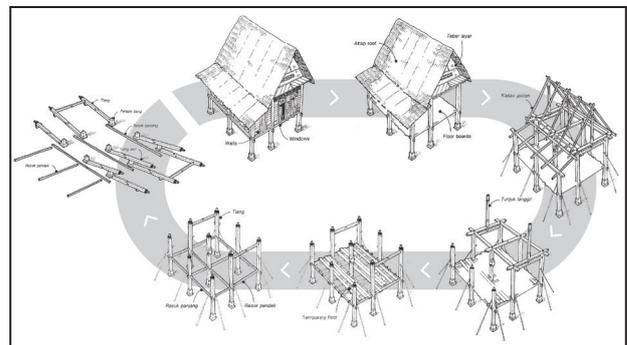


Figure 2: The disassembly and assembly process of a basic traditional Malay house, figure reproduced and edited from Lim (1987).

The basic form has been perfected in its building system, characterised by structural integrity as well as its spatial function, a result of many developments in material and construction techniques throughout the centuries. However, the traditional building system allows new adaptations and has endured several different stages in the amalgamation of form, evolving through Portuguese, Dutch and British periods of colonisation. This is a manifestation of a type of building that is fundamental to the Malay society but malleable and adopted throughout different generations and influences.

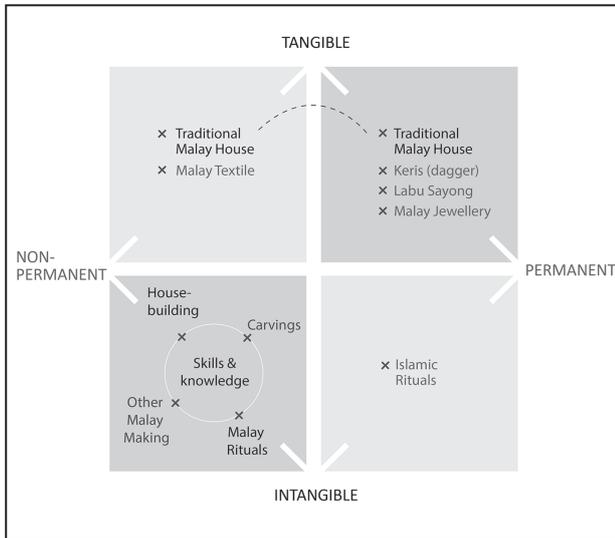


Figure 3 Tangibility, intangibility and permanency of traditional Malay houses compared with other examples of cultural heritage in Malaysia.

Despite the sophistication of traditional Malay houses, the house as an example of tangible heritage is arguably short-lived as they are currently ‘neglected and deteriorate’ rapidly (Harun 2011). Compared to the tangible heritage of buildings in a western context, generally constructed out of bricks and stones and surviving for decades, the traditional Malay house is vulnerable, mainly due to its use of timber as a structural material, the harsh tropical climatic conditions, and pressures from urbanisation. Inevitably, this example of architectural heritage is declining and is likely to disappear altogether, but perhaps more disturbingly, the process of building the house is also becoming a dying craft. For this reason, this study will probe into and identify the intangible cultural heritage of the building practices of the Malay ‘tukang’ themselves.

The study approach – recording intangible cultural heritage

Existing scholarship focusing on the subject of Malay ‘tukang’ and the construction of traditional Malay houses has examined both ‘tukang’ culture and the houses as finished buildings. Rahman (1999) outlines the required attributes of a Malay ‘tukang’ in order to qualify themselves as true master builders. He believes that in the past all Malay ‘tukang’ were dogmatic and like any member of Malay society, conformed to the traditions of Malay doctrines. Furthermore, he concluded that the Malay ‘tukang’ played a significant role in Malay architectural practice although always in harmony with the collective spirit of Malay society.

Meanwhile, Ariffin (2001) investigated the characteristics of the houses in order to uncover the underlying rules of the building system, and principles repeated and accepted as norms for generations. Ariffin examined the ‘hidden record’ in the physical and spiritual qualities of traditional Malay houses derived from cultural aspects, as well as their architectural characteristics, and concluded that they represented a complex integration of ordering principles centered on Malay anthropomorphism rather than one single dominant philosophy. Ariffin provides a fundamental explanation of the embodied knowledge that is present in vernacular architecture and analyses the causes and nature of its existence, which is beneficial to this study.

However, little research has been done to record the skills, practices and rituals of the ‘tukang’ during the process of construction of the Malay house. The author of this study set out to document these attributes of Malay ‘tukang’ as an example of intangible cultural heritage in order to arrive at a more holistic appreciation of the houses themselves and the role their construction played in shaping local society. The aim is to understand the implicit knowledge that is embedded in the houses and to examine the potential of the process of knowledge transfer within this declining trade. Therefore, the study adopts an ethnographic approach where the relationship between Malay ‘tukang’ and the process of Malay house building becomes the focal subject.



Figure 4: Modern Malay 'tukang' with his young apprentice installing the timber component in the assembly of a roof structure prior to construction on-site.

While conducting fieldwork in 2014, the author discovered a phenomenon within a group of modern Malay 'tukang', who had exploited the disassembly and assembly process of the traditional Malay house as a means to reveal evidence of rituals, indigenous and tacit knowledge embedded in each house as it was dismantled. This subconscious process of discovery undertaken by Malay 'tukang' provided a valuable opportunity for interpreting and understanding implicit information from traditional artefacts, forming an alternative mechanism of knowledge transfer.

The course of action experienced by the Malay 'tukang' is remarkably similar to the reverse engineering techniques practiced in product design and software engineering. Chikofsky and Cross (1990) define reverse engineering as a process of 'analysing a subject to identify the system's components and their inter-relationships' in order to 'create representations of the system in another form or at higher levels of abstraction'. Although this definition refers to software engineering, it can also serve as a general description within the context of this study of a method to recover values embodied in traditional Malay houses for the preservation and dissemination of its intangible cultural heritage.

The study gathers empirical evidence from fieldwork conducted in Malaysia to expand on current literature, which does not fully describe the aspect of knowledge transfer and intangible qualities in the work of Malay 'tukang'. The fieldwork documents and evaluates the individual attributes of modern Malay 'tukang' whom still practice the craft of building traditional Malay houses.

This is achieved by conducting semi-structured interviews, examining the personal traits of the modern Malay 'tukang' as well as their dexterity in the disassembly and assembly building process. Accordingly, observation of the construction process was also used to document the physical skills of modern Malay 'tukang' with visual support in the form of photographs.

A significant challenge to this study was to record the qualities of intangible knowledge and the tacit skills of a Malay 'tukang'. Wood (2009) recognises this obstacle when trying to persuade craftsman to describe the rationale in their actions to others. She illustrates the issues as 'skills involved in undertaking such craft practice involv[ing] a high degree of tacit knowledge which is internalised' and hence, the author acknowledges a similar difficulty for the Malay 'tukang' to describe their actions verbally.

Nevertheless, by adopting learning theories such as situated learning, constructionism, and others, the interviews conducted and the actions of Malay 'tukang' observed could be justified theoretically. For example, constructionism theory advocates person-centered discovery learning where a learner uses the information they already know to acquire more knowledge, which happens most effectively as the learner is actively making tangible objects in the real world. As such, the theory resonates with the hands-on activity of modern Malay 'tukang' in the process of disassembly and assembly.

Malay 'tukang' and the disassembly and assembly process

The Malay word 'tukang' is translated into English as 'craftsman' or 'artisan', but such a literal and limited description does not express its deeper meaning. The Malay apprentices are not only taught by the Malay 'tukang' to be equipped with technical skills but also the moral and social consciousness that Malay society upholds. This obligation leads to a deeper understanding of both the material and spiritual aspects of building the traditional Malay house where strict rituals are considered to be a necessary procedure in the building process. Hence, the word 'tukang' is more appropriate to connote the quality of Malay Master craftsman.

In a western context, the concept of apprenticeship is bounded by Sennet's (2009) description of the hierarchy of labour between a Master craftsman and their apprentices thus, it requires a physical relationship. Similarly, in the craft of building traditional Malay houses, the apprentice was subject to 'tukang' doctrines and ways of making, passed down through rituals and technical know-how, based on an oral culture that was eventually lost through time. This study challenges this notion of apprenticeship in contemporary culture by suggesting that tangible artefacts such as the traditional Malay house can serve as an alternative mechanism for new Malay apprentices to learn the traditional knowledge that is embodied within them. The process of disassembly and assembly is central to this phenomenon.

	Tukang 1	Tukang 2	Tukang 3
Craftsman	✓	✓	✓
Pawang	✓		
Ketua Adat or Imam	✓	✓	
Carver		✓	

Figure 5: Modern Malay 'tukang' in correspondence to the attributes mentioned by Rahman (1999)

Rahman (1999) describes at least four key attributes of great Malay 'tukang'; they must be a good craftsman, a shaman who can please the spirits, an Imam or one that can lead a cultural or religious congregation, and finally a skilled carver. While all of the modern Malay 'tukang' interviewed were considered to be good craftsmen, at least two of them fulfilled the three other attributes mentioned. They were never apprentices to a master but are similarly proficient in the traditional trade, for example possessing the ability to specify building component quantities and sizes, make interlocking mortise joints and understand the procedural process required. This includes the skills implicit in marking and identifying each building component to correspond with the disassembly and assembly system used in the past.

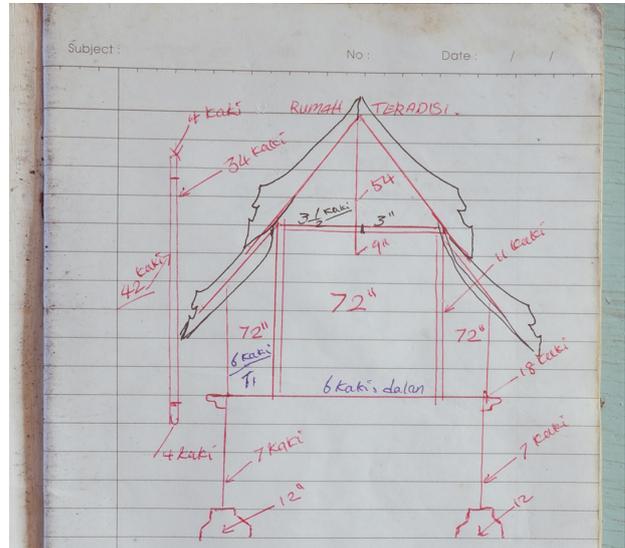


Figure 6: Sketch by the modern Malay 'tukang', outlining the dimension of each building component during the design stage in order to specify material quantity.

The author's survey revealed that all modern Malay 'tukang' agreed that their involvement in the disassembly and assembly process contributes to their understanding of traditional building techniques. As a result, these modern Malay tukang are constantly referencing their experiences and objects they have encountered in building traditional Malay houses when describing their techniques. This demonstrates that direct communication with tangible heritage artefacts during the disassembly and assembly is possible, as 'building components will talk back to you through [the] emotion, sense and memory it has preserved' (Harun 2011).

The Disassembly and Assembly process of building traditional Malay houses first occurs at an early stage of traditional construction. Some of the building components such as the roof structure were first built on the ground before being dismantled and re-assembled once the main structural posts are in place. The disassembly and assembly process involves the 'tukang', apprentices, as well as participation from the village community at key moments through participation in cultural ceremonies. However, at present, traditional Malay houses are dismantled and salvaged into other objects such as furniture, which does not contribute to the preservation of tangible as well as intangible cultural heritage.

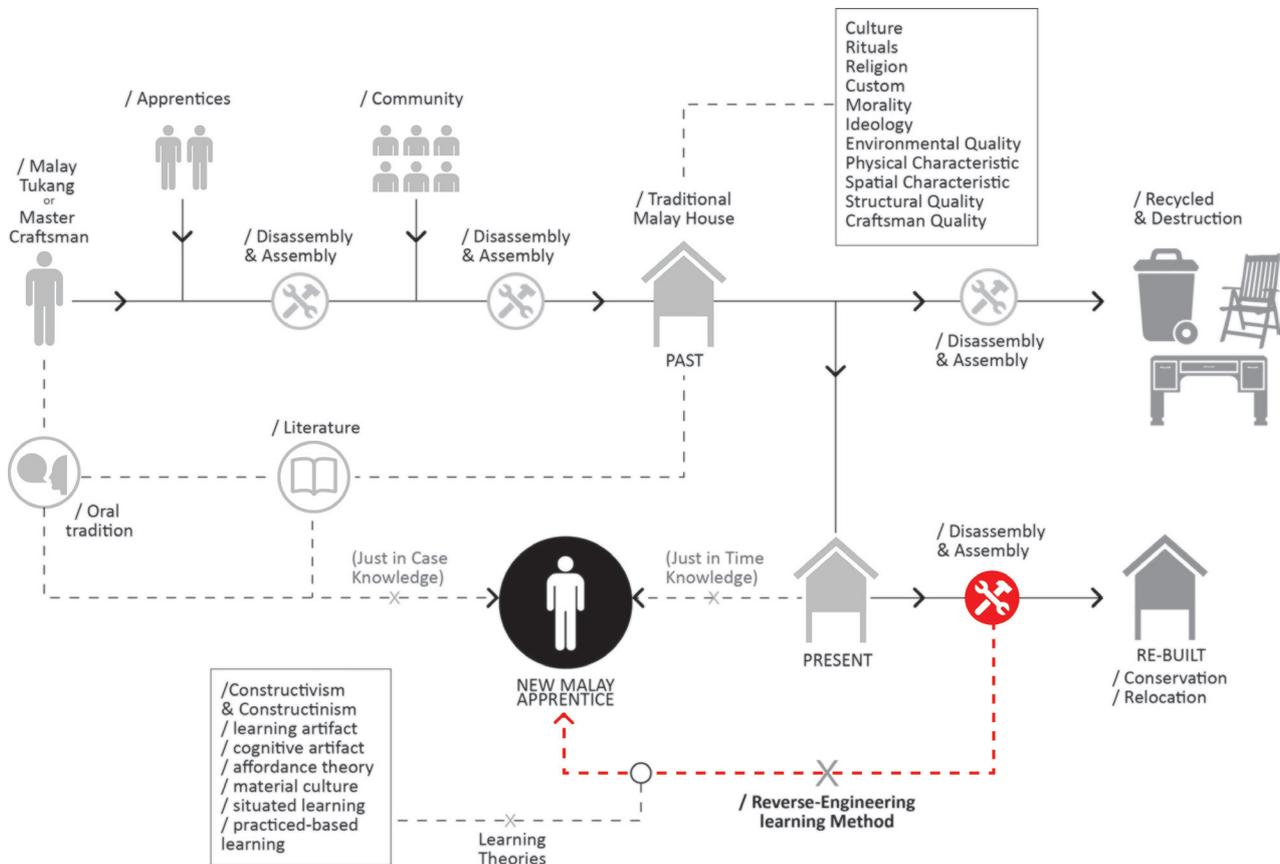


Figure 7: Overall framework of the study to narrate the process of knowledge transfer and the practice of the disassembly and assembly at key moments in the lifetime of a traditional Malay house.

The contemporary disassembly and assembly process relies on heritage building conservation practices conducted by individuals or governmental bodies. Building conservation practices involve various procedures that include preservation, reconstruction, restoration and rehabilitation, benefitting the Malay ‘tukang’ as they come into direct physical contact with the unfolding material and ritual evidence embodied within the structures. The modern Malay ‘tukang’ find that they are often surprised by new discoveries, requiring modification of their personal interpretation that may challenge their own ideas and beliefs concerning Malay house building.

Knowledge transfer through reverse engineering

Unlike other examples of tangible cultural heritage throughout the world, the traditional Malay house allows the process of disassembly and assembly, as it is traditionally part of the construction technique that uses timber wedges to secure a timber framed structural system. The Malay’s belief system, encompassing spiritual judgment, influences the way houses were made and the constant need for relocation and reorientation of the house to fulfill different cultural and religious requirements. The disassembly and assembly process, therefore, provides a platform for reverse engineering method to take place.



Figure 8: This ninety year old traditional house was disassembled from Pahang and re-assembled in The University Putra Malaysia, Selangor, as a conservation exercise coordinated by the Malay Heritage Museum. The reconstruction includes the use of modern day material as part of the roofing element.

Reverse engineering, normally associated with product designs and software engineering, is practically experienced by modern Malay ‘tukang’ during their involvement with conservation practices. Each modern Malay ‘tukang’ interviewed by the author had worked on at least ten houses that were dismantled and reconstructed. Taking apart traditional Malay house is an intricate and complex procedure. The modern ‘tukang’ have learned to expect the unexpected from hidden jointing and unconventional features, and thus, the element of exploration and discovery here suggests a learning process that is constantly probed within each stage of disassembly and for much of the experience gained, manifests embodied knowledge from the past.



Figure 9: The disassembly and assembly process requires the understanding of procedural techniques as each building components are assembled based on sequential order.

Embodied knowledge not only relates to the building system, techniques and craftsmanship but also includes historical rituals related to the construction. One ritual conducted during traditional Malay house assembly was to place a coin or a tin ore underneath each of the main timber posts for prosperity (Lim 1987), and hence the year the house was built will only be known if the house is dismantled as the information is hidden from plain sight. Although the ‘tukang’ for a house cannot usually be identified, the consistency and level of perfection in the intricacy of internal jointing that is sometimes hidden by the apparent simplicity of the appearance speculates the mastery skills of a ‘tukang’ and other traits symbolised through structural detailing. These signs and many others will only be uncovered during the disassembly and assembly process, however, in order to understand the traditional Malay house, one requires “reasoning, observations, attention and tactile senses”² .

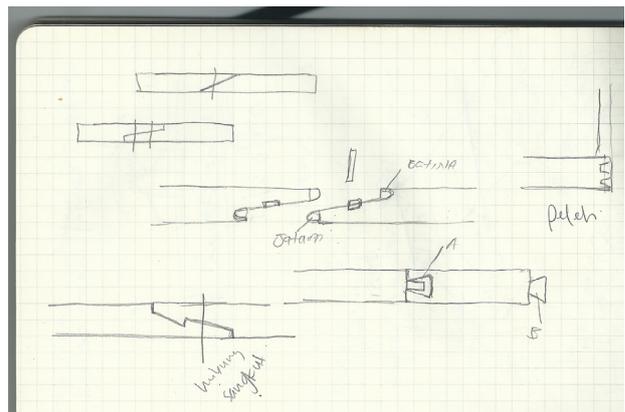


Figure 10: Sketch by modern Malay ‘tukang’ demonstrating a splicing joint found during disassembly and assembly, to increase the timber’s length. The joint depicts the concept of male and female elements that utilise draw pins to secure the timber pieces together.

The traditional Malay house can therefore foster the discovery of intangible knowledge heuristically through the disassembly and assembly process. It promotes reflective learning of Malay house building by new apprentices. The simplicity of the construction process of the house, its capacity to be replicated, its flexibility to adapt, its promotion of cooperative values, and its embodiment of local rituals and practices reflecting the lifestyle and belief of Malays; are all qualities which enrich the knowledge passed down from one generation to the next. These traits are summarised on the next page.

Simplicity

The techniques of building the Malay house, employing timber wedges and the 'tanggap'³ joinery system, are straightforward and repetitive. The building concepts are only limited to horizontal and vertical planes and thus reduce the amount of technical structural knowledge required. New Malay apprentices can employ their understanding of the fundamental techniques of Malay house building in the disassembly process although it takes years to master new construction. Unlike the complexity of Japanese traditional architecture, which also often includes the practice of reconstruction⁴, the traditional Malay house allows for constant sporadic improvements to be made, requiring fewer craftsmen to undertake. Therefore the simplicity of the house makes it easy for new Malay apprentices to efficiently manage the building process, recording and learning the elaborate construction procedures.

Flexibility

Another characteristic of the traditional Malay house is the flexibility of its form and building detail. Since 'tanggap' joinery system is well established in Malay house building, the house can be adapted to meet the household's physical needs and spatial requirements. Using the same construction technique, the traditional Malay house can be constructed as a nine, twelve or sixteen - post house (Hilton 1992), or even developed into much larger forms such as palaces. The traditional Malay 'tukang' adopted their own measurement systems using parts of their hand and body, and accordingly, the proportions of a traditional Malay house were derived from anthropometric measurements of the housewife – a key ritual (Lim 1987). This provides historical evidence of the inhabitant's cultural distinctiveness as well as the building principles (Ariffin 2001) adopted by past Malay 'tukang'.

Reproducibility

The flexibility and adaptability of traditional building systems promotes regional expressions of the traditional Malay house in terms of style and cultural necessity. Construction techniques are adopted throughout different regional houses with variations in ornamentation and configurations of building elements. While the traditional Malay houses in the west coast of the Malay Peninsula are derived from Thai influences, houses in the south region have influences from an ethnic group derived mainly from West Sumatra in Indonesia. New Malay apprentices can exploit the different styles of traditional Malay houses to express cultural differences, transformations and narratives, describing the development of Malay society from different regional contexts.

Cooperative values

The process of building a traditional Malay house requires participation between a Malay 'tukang', his apprentices, as well as the involvement of the village community with various roles and tasks undertaken at different stages. In the past, almost all able-bodied males were likely to be 'tukang' in one form or another (Rahman 1999). This is because the initial stage of erecting structural timber posts is laborious and requires manpower from village communities coming together in a construction ceremony of erecting the main structural posts. Such a tradition of community involvement manifests a building culture that was intentionally bequeathed to the next generation, providing them with a foundation in applied knowledge and other means of sharing skills in traditional building. Therefore, a traditional Malay house is readily accessible for new Malay apprentices to exploit and acquire knowledge from.

Exemplifying Malay-ness

The rootedness of new Malay apprentices in their own culture enables a particular and distinctive approach towards working with traditional structures, allowing them to understand the procedural methods and rituals in Malay house building. The construction practices and the built-form of traditional houses reflect the culture and spiritual belief system of the Malay people. Therefore the process of disassembly and assembly is a familiar process for new Malay apprentices or anyone who understands and practices the Malay culture. This is due to the fact that Malay customs are depicted on key features of the house, such as the orientation towards the Qibla⁵, the organisation of space to demarcate the male and female area, and the symbolic meanings of each ritual that resonates with Malay beliefs.

The inseparable association between Malay culture and the house building process suggests that this intellectual endeavor forms a basis for a direct understanding of the phenomenology of Malay building trade practiced in the past. As such, the association new Malay apprentices have with the history of their own civilisation has transformed the traditional house into a sensible source of past building knowledge.

Rituals as guidelines

Rituals are important entities within the process of building the traditional Malay house and express the strong associations local societies make between their emotional, physical and mental co-existence with other forces of life. This mutual understanding of the perceived relationship between man, nature and the spirits is dominant within the Malay building process, which has evolved from an animistic ideology to incorporate Islamic religious doctrine, albeit most of the physical building procedures have remained the same. Although deemed irrelevant at present, past rituals work in unison with physical practices in order for the whole building process to be completed efficiently.

Each ritual has its purpose, such as the selection of a site, that requires a Malay 'tukang' or 'pawang'⁶ to conduct a spiritual rite to determine whether the soil and environment is fit to live on and suitable to erect a timber framed house. The rituals become important procedural staging posts in a lengthy process requiring precision and strategy, from gathering wood in the forest to the assembly of the roof structure on site. Today, the process of disassembly and assembly of something that was so carefully built becomes part of the learning tool kit for apprentices to rediscover and adapt rituals practiced in the past.

Conclusion

The author of the study attempts to provide an alternative interpretation of intangible knowledge transfer within the process of building the traditional Malay house. Fieldwork revealed that modern Malay 'tukang' have exploited the process of disassembly and assembly in the conservation of traditional heritage buildings in order to learn traditional craftsmanship and to become master craftsmen themselves. The disassembly and assembly process is an activity that permits the preservation of intangible cultural heritage – construction practices and cultural artefacts that previously have been taken for granted.

The study questions the criteria for the declaration of National Heritage property under Malaysia's National Heritage Act 2005 section 67, which states that heritage property should pose 'the potential to educate, illustrate or provide further scientific investigation in relation to Malaysian cultural heritage'. While current practice declares selective traditional Malay houses worthy of safeguarding based on their historical significance and association with prominent figures in Malay society, this study suggests a manner in which many if not all traditional Malay houses are treated as important national artefacts for the purpose of knowledge transmission through the process of disassembly and assembly.

Furthermore, the study expands on UNESCO's definition of intangible cultural heritage by providing a mechanism for approaching intangible cultural heritage that is distinct to the Malaysian context. Rather than treating conservation of heritage artefacts as a static process, exploring embodied intangible knowledge through disassembly and assembly is an intervention that constitutes a practice worthy of documentation and protection in itself.

Additionally, the relative cultural value of a given artefact and the values of the practices associated with the alteration of that artefact must co-exist in a state of dynamic flux. Decisions about what actions to priorities must be taken on a case-by-case basis, taking into account the particular circumstances of an example and the practices in question.

Further research will analyse the work of modern Malay 'tukang' and document the learning and discovery within an activity that is a dominant part of a traditional building system. Ultimately, the disassembly and assembly of a traditional Malay house suggest an alternative and invaluable approach to knowledge transfer for future

Notes

- ¹ For the complete English text of the Convention, see UNESCO. 2003. International Convention for the Safeguarding of the Intangible Cultural Heritage (Paris, October 17, 2003) <http://unesdoc.unesco.org/images/0013/001325/132540e.pdf> (retrieved March 20, 2015)
- ² This is a quote by Pok Mang, one of the modern Malay tukang interviewed during the fieldwork.
- ³ An interlocking building system used by the Malay which is similar to a mortise and tenon joints.
- ⁴ It was a tradition in some Japanese architecture such as the Ise Grand Shrine to be reconstructed every twenty years to purify the site and renew materials.
- ⁵ Qibla is an Arabic word describing a fixed direction towards Kaaba in Mecca, the holy city for Muslims and the direction faced when they pray.
- ⁶ Pawang is a person who knows the rites and rituals involved in the construction of traditional Malay house in order to placate the spirits.

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1st September 2016

Assalamualaikum wbt,

The Safeguarding in Skills and Knowledge of Malay *Tukang* with Regards to the Conservation Project of Kampung Teluk Memali Mosque

We are a team of researchers from Sheffield School of Architecture, The University of Sheffield, UK, writing to offer our advice in relation to the Kampung Teluk Memali Mosque. In the following, we present our opinion on a unique advantage within traditional Malay building conservation that may have relevance to your conservation project.

2. Firstly, we would like to commend ATSA Architects and the parties involved in this conservation project on your effort to conserve one of Malaysia's national treasures in architectural heritage as part of the corporate social responsibility programme. It is our hope that your efforts will inspire other Malaysian practices to take the same actions to preserve our architectural heritage for future generations to admire and experience.

3. Indigenous Malay structures such as the Kampung Teluk Memali Mosque are an important part of the tangible cultural heritage of Malaysia. Though it is undoubtedly important to preserve the authenticity of traditional structures for future generations, our current research (examining the culture of Malay master craftsman or *tukang* mainly in Terengganu) suggests that it is also paramount that the skills and knowledge of Malay or local *tukang* are passed down to the next generation. We have identified a unique characteristic embodied within traditional Malay building culture – the 'buka-pasang', or the practice of 'disassembly and assembly' acting as the facilitator for knowledge transfer and ultimately the survival of the Malay *tukang's* legacy.

3. It is anticipated that the relocation and conservation practice of the Kampung Teluk Memali Mosque will include 'disassembly and assembly' process, therefore we believe that this practice could provide the means to reveal evidence of Malay rituals, indigenous and tacit knowledge embodied in each building component of the mosque. The subconscious process of 'discovery' undertaken by a *tukang* within the 'disassembly and assembly' process offers a valuable opportunity for interpreting and understanding implicit information, forming an alternative mechanism of knowledge production and transmission. Based on our observations, this is similarly evident in the experience and practice of contemporary *tukang* who still practice this traditional trade. These *tukang*, who, in their possession of traditional craft knowledge acquired from years of experience in 'disassembly and assembly', can bridge the generation gap

between the construction of traditional Malay houses in the past and the skills needed for their preservation and development in the present.

4. The late Master Craftsman Nik Rashiddin mentioned that ‘the craftsman imbibes the spirit of his civilization from an artefact (traditional Malay building structures), [as it] is invested with a spirit that endures’ throughout generations. Our findings imply that the ‘disassembly and assembly’ process not only reveals tacit knowledge of its original *tukang*, but also of his indigenous Malay craftsmanship. This resonates with the words of a *tukang* from Terengganu; “I don’t have a teacher (..) [but] old timbers and traditional houses have become my teachers”, referring to his learning experience in ‘disassembly and assembly’. Likewise, the careful actions taken by *tukang* in regard to each building component, and interactions from the micro scale (building components) to the macro scale (form and Malay concept) of Malay structures and vice-versa, is similarly expressed by anthropologist Trevor Marchand’s view towards the mastery of craft in traditional minaret builders of Sana’a as “transforming them (artefacts) into objects of knowledge through the physical process of making concrete objects that can be known”. Furthermore, this provides a unique opportunity for current *tukang* to learn the trade of the past and eventually realize his mastery of the traditional Malay architecture by attaining the attributes of accomplished Malay *tukang* described by Abdul Rahman in his paper entitled ‘The Traditional Malay Architectural World View’ : (1) a craftsman who can build perfect structures, (2) a *pawang* or shaman that knows how to deal with spirits, (3) a *ketua adat* who can lead religious proceedings and (4) a carver who produces intricate ornaments.

4. Though we understand that the work of dismantling the mosque has been ongoing since June 2016, it is our aspiration and recommendation that Malay or local *tukang* are given the opportunity to offer their expertise throughout the conservation project to take advantage of their knowledge and technical know-how as well as to disseminate this knowledge among the individuals involved. Our research also suggests that contemporary *tukang* are not only proficient in the construction of traditional Malay building but also other aspects of Malay culture that are now declining.

5. Other recommendations pertinent to the issues discussed are mentioned below:

- a) The conservation practice should be committed to employ local craftspeople or *tukang* in order for their craft skills to develop. Two similar undertakings in the state of Terengganu – initiating the Terrapuri Heritage Village and the Pasak Pertukangan Kayu workshop – gave rise to ten or more groups of skilled Malay and local *tukang* practicing this traditional trade. Regrettably, recent conservation of traditional Malay houses conducted in Selangor and Negeri Sembilan missed the opportunity to cultivate and develop the skills of local *tukang* by engaging foreign workers throughout its rebuilding process. Our main concern is to empower a new generation of *tukang* who are knowledgeable and competent in both the construction as well as the preservation of the indigenous Malay knowledge embodied in these buildings.
- b) The involvement of *tukang* at an earlier planning stage of the conservation project has its benefits, instead of the common practice of engaging them only during the reconstruction stage on site. Contemporary *tukang* have years of experience in dealing with traditional Malay structures and have developed their own methods and techniques in ‘disassembly and assembly’ as well as in the preservation process. Our observations in a conservation project of a traditional Malay house in Terengganu indicated that at a certain stage of the development, necessary alterations were made from initial design on the advice of the *tukang*. Modifications were accepted more favorably than those provided by the

consultants, based on the *tukang's* comprehension of the conventions of Malay spaces and construction techniques absorbed from his extensive involvement in the 'disassembly and assembly'. If only the *tukang* were consulted earlier, the conservation project may have ideally been completed smoothly and on schedule.

- c) Finally, the public interest in the conservation process should be recognized and construction information in the form of up-to-date images or technical drawings should be made public in order to attract future generations of *tukang*. Site visits for students as well as local craftspeople and the records of on-going findings that are accessible to all, encourages new knowledge to flourish. In the previous year, our public lecture on Malay *tukang* culture attracted a lot of interest from both locals and overseas experts, however there is a lack of available Malay building artefacts and information for further study especially on the process of 'disassembly and assembly' of traditional Malay structures. Therefore, the conservation of Kampung Teluk Memali Mosque provides a unique opportunity to set a new benchmark for contemporary conservation practice.

6. Our sincere intention is to focus on the need to save a dying craft culture from extinction as history has proven that despite colonial influence and development in techniques and material, the craft of traditional Malay building continued to evolve. Reflecting Ibn Khaldun's Muqaddimah concern about the danger of blindly trusting tradition, instead we propose that the traditional Malay building culture should be elevated in response to technological advancement in the construction industry so present generations of local *tukang* can continue to develop their practice. Since *tukang* are the bearers of our heritage craft inheritance, it is time that they are respected once again as the 'master craftsmen' that they are.

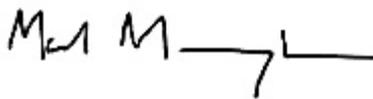
It is our hope that ATSA Architects and the conservation parties involved will consider and embrace the case presented above although this conservation project is currently on going and progressing on site. We believe that by drawing attention to these important issues we could start a new dialogue about the future of our intangible cultural heritage and the role it played towards the development of skills and knowledge in Malaysia building culture.

We value your attention and judgment in this matter, Terima Kasih.

Yours sincerely,



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As'salamu-Alaikum w.r.b.

Dear Sir,

THE SAFEGUARDING IN SKILLS AND KNOWLEDGE OF MALAY TUKANG WITH REGARDS TO THE CONSERVATION PROJECT OF KAMPUNG TELUK MEMALI MOSQUE

Referring to the above and your letter dated 1st September 2016, we wish to thank you for your interest in our effort to relocate, conserve and eventually preserve the Kampung Teluk Memali Mosque in Kampung Gajah, Perak to Taman Seri Bougainvillea, Bandar Seri Botani, Ipoh, Perak. We must also apologise for the late response to your letter due to our workload.

Firstly, we would like to commend ATSA Architects and the parties involved in this conservation project on your effort to conserve one of Malaysia's national treasures in architectural heritage as part of the corporate social responsibility programme. It is our hope that your efforts will inspire other Malaysian practices to take the same actions to preserve our architectural heritage for future generations to admire and experience.

Thank you for your kind compliment, and we hope that our effort will be successful as it is in progress. Financing through the kind donation from the public and other institutions are still badly needed to complete the conservation project successfully. We anticipate that the cost to be MYR 500,000.00 or approximately GBP 100,000.00.

Indigenous Malay structures such as the Kampung Teluk Memali Mosque are an important part of the tangible cultural heritage of Malaysia. Though it is undoubtedly important to preserve the authenticity of traditional structures for future generations, our current research (examining the culture of Malay master craftsman or tukang mainly in Terengganu) suggests that it is also paramount that the skills and knowledge of Malay or local tukang are passed down to the next generation. We have identified a unique characteristic embodied within traditional Malay building culture – the 'buka-pasang', or the practice of 'disassembly and assembly' acting as the facilitator for knowledge transfer and ultimately the survival of the Malay tukang's legacy.

We are fortunate and pleasantly surprised that many of the 'tukang' can also be found in the Perak region. The 'buka-pasang' approach had been used and prevalent during the early years when the inhabitants of these areas were living here. Through our research, many of the early carpenters came from North Asia, the Chinese or Indo-Chinese regions and also from the Nusantara region, from Sumatra, Java and even from traders ploughing this area.

It is anticipated that the relocation and conservation practice of the Kampung Teluk Memali Mosque will include 'disassembly and assembly' process, therefore we believe that this practice could provide the means to reveal evidence of Malay rituals, indigenous and tacit knowledge embodied in each building

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component of the mosque. The subconscious process of 'discovery' undertaken by a tukang within the 'disassembly and assembly' process offers a valuable opportunity for interpreting and understanding implicit information, forming an alternative mechanism of knowledge production and transmission. Based on our observations, this is similarly evident in the experience and practice of contemporary tukang who still practice this traditional trade. These tukang, who, in their possession of traditional craft knowledge acquired from years of experience in 'disassembly and assembly', can bridge the generation gap between the construction of traditional Malay houses in the past and the skills needed for their preservation and development in the present.

Yes, we share the same concerns and anticipation whenever the during 'disassembly and assembly' process. All of the concerns will be addressed or recorded if they so arise. We have also appointed a licensed conservator with considerable knowledge in this area. Many of the traditions whenever possible have been practiced and replicated. As an example, before the mosque was disassembled, we had a thanksgiving ceremony also known as 'Kenduri Doa Selamat' ceremony. We will also be having another ceremony once the main columns or Tiang Seri are erected.

The late Master Craftsman Nik Rashiddin mentioned that 'the craftsman imbibes the spirit of his civilization from an artefact (traditional Malay building structures), [as it] is invested with a spirit that endures' throughout generations. Our findings imply that the 'disassembly and assembly' process not only reveals tacit knowledge of its original tukang, but also of his indigenous Malay craftsmanship. This resonates with the words of a tukang from Terengganu; "I don't have a teacher (...) [but] old timbers and traditional houses have become my teachers", referring to his learning experience in 'disassembly and assembly'. Likewise, the careful actions taken by tukang in regard to each building component, and interactions from the micro scale (building components) to the macro scale (form and Malay concept) of Malay structures and vice-versa, is similarly expressed by anthropologist Trevor Marchand's view towards the mastery of craft in traditional minaret builders of Sana'a as "transforming them (artefacts) into objects of knowledge through the physical process of making concrete objects that can be known".

Furthermore, this provides a unique opportunity for current tukang to learn the trade of the past and eventually realize his mastery of the traditional Malay architecture by attaining the attributes of accomplished Malay tukang described by Abdul Rahman in his paper entitled 'The Traditional Malay Architectural World View': (1) a craftsman who can build perfect structures, (2) a pawang or shaman that knows how to deal with spirits, (3) a ketua adat who can lead religious proceedings and (4) a carver who produces intricate ornaments.

This is one the reasons why we took the challenge to preserve the mosque, which is approximately 100 years old and was left in the state of disrepair for approximately 20 years. In our observation, all 'tukang' are not the same or had obtained the same level of expertise. Based on our research, the architecture may differ from each of the states, and their beliefs or 'adat' may also differ from one to another.

Though we understand that the work of dismantling the mosque has been ongoing since June 2016, it is our aspiration and recommendation that Malay or local tukang are given the opportunity to offer their expertise throughout the conservation project to take advantage of their knowledge and technical know-how as well as to disseminate this knowledge among the individuals involved. Our research also suggests that contemporary tukang are not only proficient in the construction of traditional Malay building but also other aspects of Malay culture that are now declining.

We believe at times there were various influences, be it from the ruler at that time, a nobleman or simply the climate can result in a different approach. As there is no other written records or generation of carpenters still around to tell the story or continue the exact tradition in building or carpentry.

1. We have selected one of the best set of craftsmen found in the state of Perak

2. We will follow the 'adat' which are seen as expectable today. As you may know that Islam in this region is 'Islam beradat,' which religion has been intertwined procedures and rituals.

Other recommendations pertinent to the issues discussed are mentioned below:

a) The conservation practice should be committed to employ local craftspeople or tukang in order for their craft skills to develop. Two similar undertaking in the state of Terengganu – initiating the Terrapuri Heritage Village and the Pasak Pertukangan Kayu workshop – gave rise to ten or more groups of skilled Malay and local tukang practicing this traditional trade. Regrettably, recent conservation of traditional Malay houses conducted in Selangor and Negeri Sembilan missed the opportunity to cultivate and develop the skills of local tukang by engaging foreign workers throughout its rebuilding process. Our main concern is to empower a new generation of tukang who are knowledgeable and competent in both the construction as well as the preservation of the indigenous Malay knowledge embodied in these buildings.

Yes, all of the assembly and disassembly of the mosque were and are being carried out by local 'tukang' or workman. We are also inviting local university students to be involved in the construction of the mosque. Unfortunately, the preservation and conservation of traditional timber structure in Malaysia are not very common, although there are some efforts to retain them. We believe, this mosque relocation, preservation, and conservation is probably the only ongoing and such effort in Malaysia currently.

a) We share the same approach, whenever it is possible. We also share the same opinion as yours in the preservation of indigenous Malay knowledge.

b) The involvement of tukang at an earlier planning stage of the conservation project has its benefits, instead of the common practice of engaging them only during the reconstruction stage on site. Contemporary tukang have years of experience in dealing with traditional Malay structures and have developed their own methods and techniques in 'disassembly and assembly' as well as in the preservation process. Our observations in a conservation project of a traditional Malay house in Terengganu indicated that at a certain stage of the development, necessary alterations were made from initial design on the advice of the tukang. Modifications were accepted more favorably than those provided by the consultants, based on the tukang's comprehension of the conventions of Malay spaces and construction techniques absorbed from his extensive involvement in the 'disassembly and assembly'. If only the tukang were consulted earlier, the conservation project may have ideally been completed smoothly and on schedule.

b) We have consulted both the conservator and the 'tukang' and the various consultants. All decisions up until today were based on consensus. Our objective, other than conservation and preservation is that the restored mosque will be used again as a mosque for praying and other religious ceremonies or education.

c) Finally, the public interest in the conservation process should be recognized and construction information in the form of up-to-date images or technical drawings should be made public in order to attract future generations of tukang. Site visits for students as well as local craftspeople and the records of on-going findings that are accessible to all, encourages new knowledge to flourish. In the previous year, our public lecture on Malay tukang culture attracted a lot of interest from both locals and overseas experts, however there is a lack of available Malay building artefacts and information for further study especially on the process of 'disassembly and assembly' of traditional Malay structures. Therefore, the conservation of Kampung Teluk Memali Mosque provides a unique opportunity to set a new benchmark for contemporary conservation practice.

c) Presently, we are documenting the processes from before the disassembly, including all drawings and details for public reference. As it is a project mainly funded by the generosity of the public donation, or 'wakaf', we are not sure if we can have it fully published. However, we will

probably produce an e-book version of the book for viewing. We have invited several universities or institutions of higher education to be involved in the project. So far, three universities have confirmed their visit and /or assist in the construction. It is our intention as part of our corporate responsibility is to give rise or open up an opportunity for our students to learn more about the traditional mosque construction.

Our sincere intention is to focus on the need to save a dying craft culture from extinction as history has proven that despite colonial influence and development in techniques and material, the craft of traditional Malay building continued to evolve. Reflecting Ibn Khaldun's Muqaddimah concern about the danger of blindly trusting tradition, instead we propose that the traditional Malay building culture should be elevated in response to technological advancement in the construction industry so present generations of local tukang can continue to develop their practice. Since tukang are the bearers of our heritage craft inheritance, it is time that they are respected once again as the 'master craftsmen' that they are.

We also share the same hope that the techniques, materials, and craft of traditional Malay building continue to evolve. It will or must involve a direct intervention if it to be successful. We have, on the suggestion of the Sultan of Selangor, Sultan Sharifuddin to use a lead timber craftsman from Terengganu in building the mihrab and mimbar in the first Green Platinum mosque in Cyberjaya, the Raja Haji Fisabilillah Mosque, which was completed in 2015.

It is our hope that ATSA Architects and the conservation parties involved will consider and embrace the case presented above although this conservation project is currently on going and progressing on site. We believe that by drawing attention to these important issues we could start a new dialogue about the future of our intangible cultural heritage and the role it played towards the development of skills and knowledge in Malaysia building culture.

We value your attention and judgment in this matter, Terima Kasih. Thank you for your interest, and we pray that the conservation of the Kampung Teluk Memali Mosque will be completed and continue to function as a mosque in its former glory after not being used for 20 years. We also enclosed a copy of the book 'Masjid - Selected Mosques and Musollas in Malaysia' to the Sheffield School of Architecture library for your university reference. The Kampung Teluk Memali Mosque is among the 109 Malaysian mosques featured in this book.

Thank you.

Yours,


Azim A. Aziz
Chief Executive Officer



Tarikh : 9 September 2016

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As'salamu-Alaikum w.r.b.

Tuan,

***THE SAFEGUARDING IN SKILLS AND KNOWLEDGE OF MALAY TUKANG WITH REGARDS TO THE
CONSERVATION PROJECT OF KAMPUNG TELUK MEMALI MOSQUE***

Terima kasih di atas pandangan dan keprihatinan tuan dalam kerja-kerja pemuliharaan Masjid Kampung Teluk Memali yang sedang kami usahakan. Pandangan tuan akan kami jadikan panduan dan semangat untuk terus berusaha melindungi aset warisan senibina Melayu dan tradisional.

2. Saranan pihak tuan untuk mengangkat peranan tukang kayu ke tahap yang lebih tinggi merupakan satu saranan yang baik. Sehubungan ini projek Masjid Kampung Teluk Memali telah melibatkan dua entiti tukang iaitu kerja-kerja menanggal dan pemasangan semula. Satu pihak lain, kami juga telah melantik tukang kayu dalam kerja-kerja pemulihan. Tukang dari segi terminologi ialah individu atau kumpulan yang menjalankan kerja-kerja pertukangan, pemasangan, pengukir dan pembinaan rumah tradisional di zaman dahulu, hari ini tukang wujud dalam pelbagai entiti seperti kontraktor, pemilik kilang pembinaan berasaskan kayu, pembuat perabut, pengukir dan sebagainya. Untuk makluman pihak tuan, kesemua pihak-pihak ini sedang terlibat dalam kerja-kerja pemuliharaan Masjid Kampung Teluk Memali dan lebih menarik mereka merupakan entiti tempatan.

3. Saranan tuan berkenaan kepentingan lukisan teknikal bangunan tradisional merupakan satu kesedaran yang perlu ada pada semua pihak agar dokumentasi bangunan tradisional yang tidak berupaya bertahan lama dapat diselamatkan. Untuk itu, pihak kami telahpun menyiapkan lukisan teknikal ini sejak 2010 lagi oleh Politeknik Ungku Omar, Ipoh, Perak. Malah sebelum kerja-kerja pemuliharaan dijalankan pada tahun 2015, lukisan teknikal ini telah disemak semula di tapak dan dikemaskini dengan bantuan dari ATSA Architects sendiri. Sesungguhnya penglibatan pelajar seharusnya dipertingkatkan agar kesedaran mengenai kepentingan binaan tradisi berkesinambungan dari generasi ke generasi. Maka selain dari penghasilan set *measured drawings* yang lengkap dan kajian di tapak, penglibatan pelajar dalam pemuliharaan Masjid Kampung Teluk Memali ini turut melibatkan kerja-kerja pemulihan itu sendiri seperti mengecat, menyapu lapisan *anti-termite*, lawatan ke kilang dan sebagainya. Ini merupakan satu pendedahan secara *hands on* kepada para pelajar seterusnya menghayati senibina warisan.

4. Saya mengucapkan tahniah kepada tuan kerana sedang melanjutkan pelajaran keperingkat doktor falsafah, walaupun berada jauh diperantauan namun kecintaan tuan dan keprihatinan tuan dalam senibina nenek moyang kita tidak luntur. Sesungguhnya bangunan bersejarah memerlukan pembelaan yang sewajarnya memandangkan kewujudannya semakin terancam. Kami doakan sekembalinya tuan ke tanah air, tuan boleh menyertai kami dan pelbagai pihak untuk meneruskan usaha pemuliharaan bangunan warisan. Masih banyak bangunan bersejarah dan rumah tradisional yang kosong ditinggalkan seperti Masjid Kampung Teluk Memali ini yang memerlukan pembelaan. Kesemua bangunan tinggal ini mempunyai keunikan senibina dan nilai budaya Melayu yang tinggi. Pihak kami juga berharap kami dikurniakan daya dan upaya berterusan untuk memulihara bangunan warisan selepas selesainya projek Masjid Kampung Teluk Memali ini, kerana berdasarkan jumlah bangunan kosong yang ditinggalkan amat tidak seimbang dengan jumlah pihak yang berusaha memuliharanya, apatah lagi secara sukarela.

Sekali lagi pihak kami ingin merakamkan setinggi penghargaan kepada pihak tuan kerana bersama kami dalam kepayahan kami untuk melaksanakan projek pemuliharaan Masjid Kampung Teluk Memali ini. Faktor kewangan yang amat terbatas menjadikan kami lebih kreatif menghasilkan kaedah menanggal dan memasang semula dalam lingkungan kemampuan kami. Di kesempatan ini juga kami ingin menyeru kepada pihak tuan agar menyebarluaskan kepada pelbagai pihak mengenai kekurangan yang amat-amat perlu diatasi segera dalam projek Masjid Kampung Teluk Memali iaitu kewangan. Derma kewangan amat-amat dialukan dengan melayari laman web rasmi www.memalimosque.com.my.

Sekian, terima kasih sekali lagi.....sama-sama menyintai warisan kita

Yang Benar,

for 

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29 May 2016

Assalamualaikum wbt Tuan,

The Significance of Malay *Tukang* with Regards to the Refurbishment Project of Muzium Diraja Istana Lama Seri Menanti

We are a team of researchers from The University of Sheffield, UK. We write to offer our advice in relation to the current development of Malay *tukang*, and to highlight what we perceive to be a unique opportunity within the refurbishment project that the Lembaga Muzium Negeri Sembilan is currently administrating.

2. The preserved structure of Muzium Diraja Istana Lama Seri Menanti is one of its kind in Malaysia, a unique example of the heritage of Malay architecture and its past traditions. Though the preservation and maintenance of traditional Malay structures is to be encouraged for future generations, our current research examining the culture of Malay master craftsman or *tukang* highlights that it is also crucial that the skills and knowledge of Malay *tukang* should be passed down to the next generation. We have identified a unique characteristic embedded within traditional Malay building culture – the ‘buka-pasang’, or practice of disassembly and assembly as the facilitator for knowledge transfer. The findings from our study of *tukang* in Terengganu and elsewhere reveal the relationship between the disassembly and assembly of traditional Malay structures and the survival of Malay *tukang* culture.

3. The conservation of Istana Lama Seri Menanti provides an opportunity to employ the experience of Malay *tukang* in disassembly and assembly, preserving a craft legacy that carefully dictates what action should be taken in regard to each building component encountered. This process reveals the tacit knowledge and understanding of the *tukang* described by the late Nik Rashiddin: ‘The craftsman imbibes the spirit of his civilization from an artifact, [as it] is invested with a spirit that endures’. The anthropologist Trevor Marchand expressed the mastery in the craft of traditional minaret builders of Sana’a in Yemen, as a development ‘from the micro to the macro scale, or from the brick to the building... transforming them into objects of knowledge through the physical process of making concrete objects that can be known’. This is similar to the work of contemporary Malay *tukang* who, in their possession of traditional craft knowledge, can bridge the generation gap between the construction of traditional Malay houses in the past and the skills needed for their preservation in the present.

4. It is our recommendation that local Malay *tukang* are given the opportunity to offer their expertise throughout the project, from initial site survey, consultancy meetings, through to completion, as they are the bearers of our Malay craft inheritance. As our perception of Malay *tukang* has transformed from one of experts in their field to general hard labourers, it is time that they are respected once again as the 'master craftsmen' that they are. Our research suggests that contemporary Malay *tukang* are not only proficient in the construction of traditional Malay building but also other aspects of Malay culture that are now declining.

5. Though we understand that building contractors have been appointed at this stage of the conservation, it is not too late for the project to adopt the two following principles.

a) First, the contractor must be obliged to hire local craftspeople in order for their craft skills to develop. Two similar undertakings in the state of Terengganu – Terrapuri Heritage Village and Pasak Pertukangan Kayu (a workshop owned by *Ustaz* Jamal) – have led to the training and graduation of ten or more groups of skilled Malay *tukang* within Terengganu itself. Our main concern is to cultivate and empower a new generation of *tukang* who are knowledgeable and competent in both the construction as well as the preservation of the indigenous Malay knowledge embedded in these buildings.

b) Secondly, the public interest in the conservation process should be recognised and construction information should be made public in the form of up-to-date images and technical drawings. Site visits for vocational students and local craftspeople and records of on-going findings will make the project accessible to all Malaysians for new knowledge to flourish. Last year Aiman delivered a public lecture on Malay *tukang* culture that attracted a lot of interest from both locals and overseas experts, however there is a lack of available Malay building artefacts and information for further study. Therefore, the conservation of Muzium Diraja Istana Lama Seri Menanti provides a unique opportunity to set a new benchmark for contemporary conservation practice.

6. Our sincere intention is to focus on the need to save a dying craft culture from extinction. History has shown that the craft of traditional Malay building continued to evolve despite centuries of colonial intervention. Reflecting Ibn Khaldun's Muqaddimah concern about the danger of blindly trusting tradition, instead we propose that the culture of the Malay *tukang* should be cultivated in response to technological advancement within the construction industry so that new generations of Malay *tukang* can continue to develop their practice.

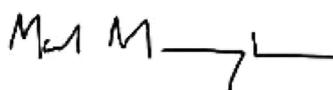
It is our hope that the case presented above will be considered by the Museum administration as well as other parties involved in this conservation project. We hope that by drawing attention to these issues we can start a new dialogue about the future of our intangible cultural heritage as well as the physical and material.

We value your attention and judgment in this matter. terima kasih,

Yours sincerely,



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29 May 2016

Assalamualaikum wbt Tuan,

Kepentingan Tukang Melayu di dalam Projek Pemuliharaan Bangunan Muzium Diraja Istana Lama Seri Menanti

Dengan segala hormatnya perkara di atas adalah dirujuk, kami adalah sekumpulan penyelidik dari The University of Sheffield, UK. Tujuan kami menghubungi pihak Tuan adalah untuk menawarkan khidmat nasihat berkaitan perkembangan terkini tukang-tukang Melayu, dan untuk mengetengahkan peluang unik daripada pemerhatian kami terhadap projek pemuliharaan bangunan yang kini diurustadbir pihak Lembaga Muzium Negeri Sembilan.

2. Pemuliharaan bangunan Muzium Diraja Istana Lama Seri Menanti merupakan salah satu contoh warisan senibina dan tradisi Melayu yang amat unik di Malaysia. Walaupun pemuliharaan dan penyelenggaraan struktur binaan tradisional Melayu amat digalakkan untuk kepentingan generasi akan datang, skop kajian kami yang merangkumi budaya pertukangan kayu oleh tukang-tukang Melayu mendapati bahawa amat penting untuk kemahiran dan pengetahuan tukang-tukang Melayu terdahulu diperturunkan kepada generasi pelapis. Kami telah mengenalpasti ciri unik yang hanya boleh didapati dalam pembinaan struktur tradisional Melayu iaitu teknik buka-pasang sebagai pemudahcara kepada proses pemindahan pengetahuan atau 'knowledge transfer'. Daripada kajian yang dijalankan ke atas tukang-tukang Melayu di Terengganu dan beberapa tempat lain mendapati bahawa terdapat kesinambungan di antara teknik buka-pasang dan peninggalan serta survival budaya pertukangan Melayu sehingga ke harini.

3. Pemuliharaan Istana Lama Seri Menanti menyediakan peluang untuk menggunakan pengalaman tukang Melayu dalam proses buka-pasang, dalam usaha mengekalkan legasi pertukangan yang menitikberatkan perencanaan dan tindakan yang perlu diambil berkenaan setiap komponen sesuatu bangunan tradisional Melayu. Proses ini memberi pendedahan kepada pengetahuan dan pemahaman tersirat seperti yang disebut Nik Rashiddin, 'tukang mendalami semangat ketamadunan daripada sesuatu artifak, kerana ianya tersimpan kemasyhuran semangat yang kekal di dalamnya.' Ahli antropologi, Trevor Marchand pula menyatakan bahawa penguasaan kepakaran dalam pertukangan tradisional pembinaan menara di Sana'a, Yemen adalah daripada perkembangan 'dari skala mikro ke makro, atau dari batuan kepada bangunan... menakrifkannya sebagai bahan ilmu melalui proses fizikal kepada pembinaan objek kekal yang boleh diketahui'. Proses ini adalah sama terhadap tukang Melayu kontemporari yang sekiranya mendalami ilmu pertukangan tradisional Melayu, mampu merapatkan jurang generasi di antara pembinaan rumah tradisional Melayu terdahulu dengan kemahiran yang diperlukan untuk pemuliharaan di masa kini.

4. Pihak kami juga mencadangkan agar tukang Melayu diberikan peluang untuk menawarkan khidmat kemahiran mereka sepanjang projek pemuliharaan ini berlaku; daripada proses awal tinjauan tapak, mesyuarat konsultan, sehingga ke akhir projek kerana mereka merupakan pewaris kepada seni pertukangan tradisional Melayu. Ini juga bertujuan untuk memperbaiki persepsi

masyarakat terhadap tukang Melayu yang dahulunya amat gah di dalam bidang mereka tetapi kini dipandang sepi. Sudah tiba masa untuk mereka diberikan semula hak dan kehormatan mereka sebagai tukang Melayu yang masyhur. Kajian kami juga mendapati bahawa tukang Melayu kontemporari bukan sahaja fasih dalam pembinaan bangunan tradisional, tetapi juga fasih dalam aspek budaya Melayu yang semakin dilupakan.

5. Pihak kami memahami bahawa pada ketika ini, kontraktor bangunan sudah dilantik untuk menjalankan kerja-kerja pemuliharaan, tetapi kami merasakan masih belum terlambat untuk mengambil kira dua prinsip berikut:

- a) Pertama, kontraktor projek ini bersetuju untuk mengambil tukang tempatan untuk perkembangan kemahiran pertukangan mereka. Dua situasi berkaitan di Terengganu- pembinaan Terrapuri Heritage Village dan penubuhan Pasak Pertukangan Kayu (bengkel kayu yang dimiliki Ustaz Jamal) telah melatih dan melahirkan sepuluh atau lebih kumpulan tukang-tukang Melayu di negeri tersebut. Perhatian utama kami adalah untuk memperkasakan generasi tukang Melayu baru yang berpengetahuan dan kompeten di dalam pembinaan, serta pemuliharaan pengetahuan tradisional Melayu yang tersimpan di dalam struktur tradisi ini.
- b) Kedua, kepentingan awam berkenaan proses pemuliharaan wajar diambil kira dan segala maklumat pembinaan perlu diumumkan kepada orang awam dalam bentuk imej terkini dan lukisan teknikal. Lawatan tapak untuk pelajar institusi vokasional dan tukang tempatan serta rekod tentang perkembangan terkini projek akan memudahkan akses kepada semua rakyat Malaysia bagi menyebarkan maklumat terbaru mengenai pertukangan tradisional Melayu. Pada tahun lepas, Aiman telah menyampaikan syarahan umum mengenai budaya pertukangan Melayu dan telah menarik minat ramai terutamanya pakar dari dalam dan luar negara. Walaubagaimanapun, kurangnya maklumat dan sumber artifak bangunan menyukarkan kajian lanjut. Oleh itu, pemuliharaan Muzium Diraja Istana Lama Seri Menanti dilihat sebagai satu peluang yang unik dan penting bagi menetapkan penanda aras baru bagi amalan kontemporari pemuliharaan bangunan tradisional.

6. Hasrat dan niat pihak kami merupakan usaha murni dalam menyelamatkan suatu budaya yang kini diancam kepupusan. Sejarah telah membuktikan bahawa industri pertukangan tradisional Melayu terus berkembang walaupun menghadapi pengaruh dan campur tangan penjajah. Ibn Khaldun di dalam karyanya, Muqaddimah, menyatakan kebimbangannya terhadap bahaya dalam mempercayai tradisi secara membuta tuli, oleh yang demikian pihak kami menyusulkan semangat dan budaya pertukangan tradisional Melayu dipupuk seiring dengan kemajuan teknologi industri pembinaan supaya generasi tukang Melayu yang baharu dapat memastikan kelangsungan amalan yang diwarisi sejak turun temurun.

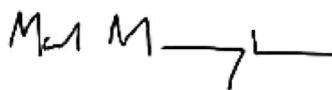
Besarliah harapan kami sekiranya kes yang dibentangkan ini dapat dipertimbangkan oleh pihak pentadbiran Muzium dan pihak-pihak lain yang terlibat sama dalam projek pemuliharaan ini. Kami berharap isu ini dapat diberi perhatian yang sewajarnya sebagai permulaan kepada perbincangan tentang masa hadapan warisan budaya tersirat serta bentuk fizikal dan pengetahuannya.

Perhatian dan pertimbangan pihak Tuan, amatlah kami hargai. Sekian, terima kasih.

Yang benar,



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Development of Skills and Knowledge

In the Process of Building the Traditional Malay House

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 The Kroto Research Inspiration Poster Competition '16
 Word Count; 485

General history and development of traditional Malay houses in Malaysia



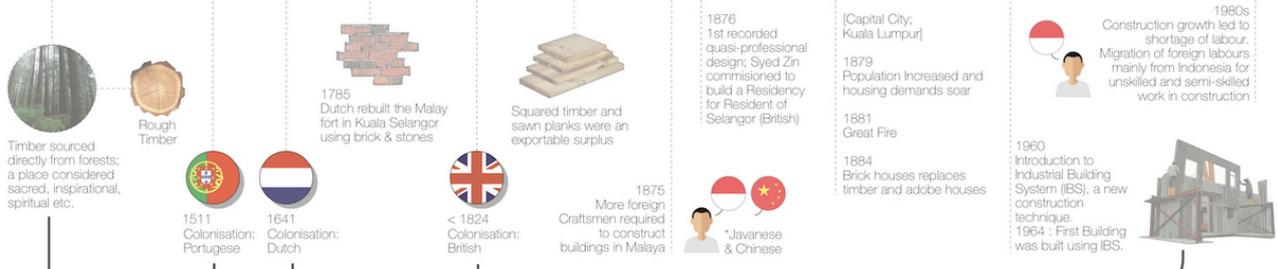
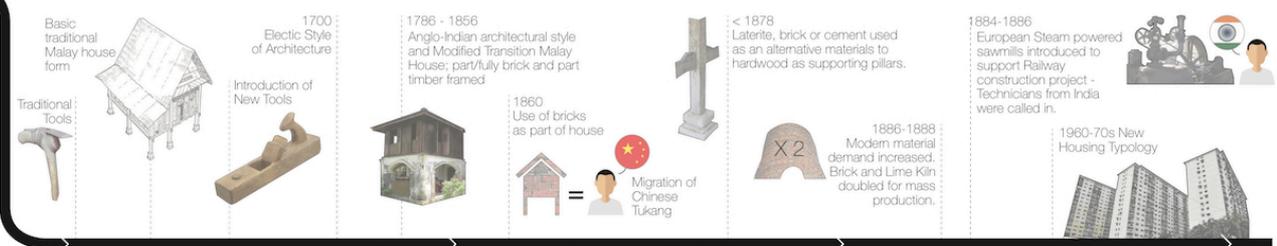
Characters of the Malay house: 'stilt footing, non-boat image, small roof, light wood construction, as compared to the heavily built forms' of other South East Asian houses. (Waterson, 1990)

Malay Master Craftsmen or *tukang* builds traditional houses based on indigenous skills, knowledge and spiritual beliefs.

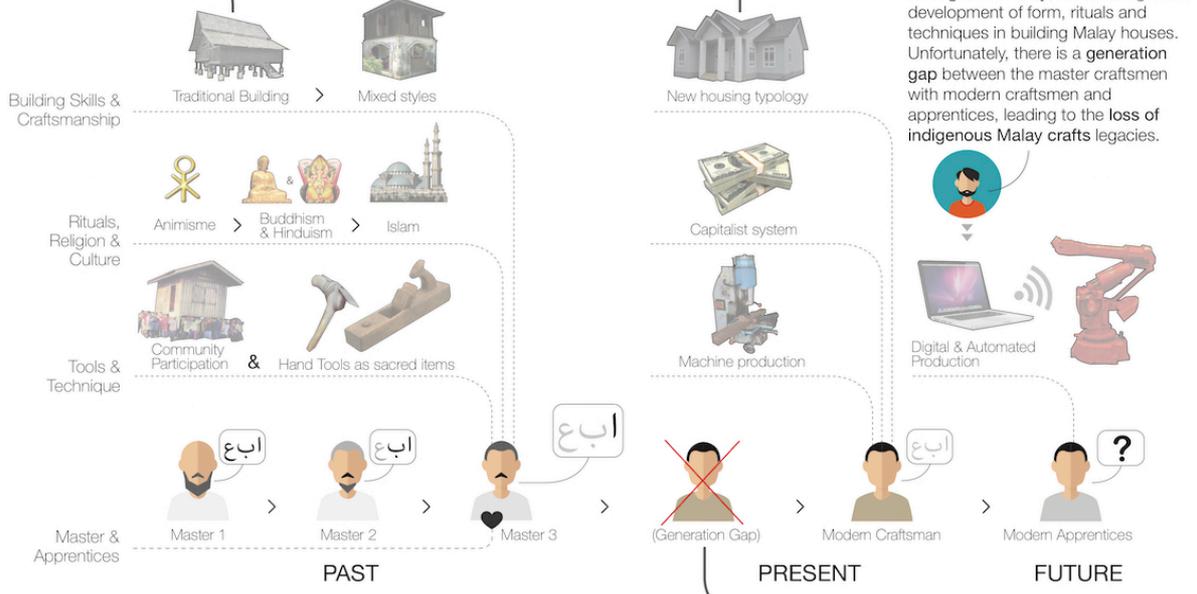
Traditional Malay houses had evolved and amalgamated with colonial architectural styles but still maintains the technique and spiritual beliefs.

At certain stage in history, migrants from China, India and Java were brought in by Colonial masters for additional labours.

Urbanization has led way for new type of construction technique, housing typology, and belief system.

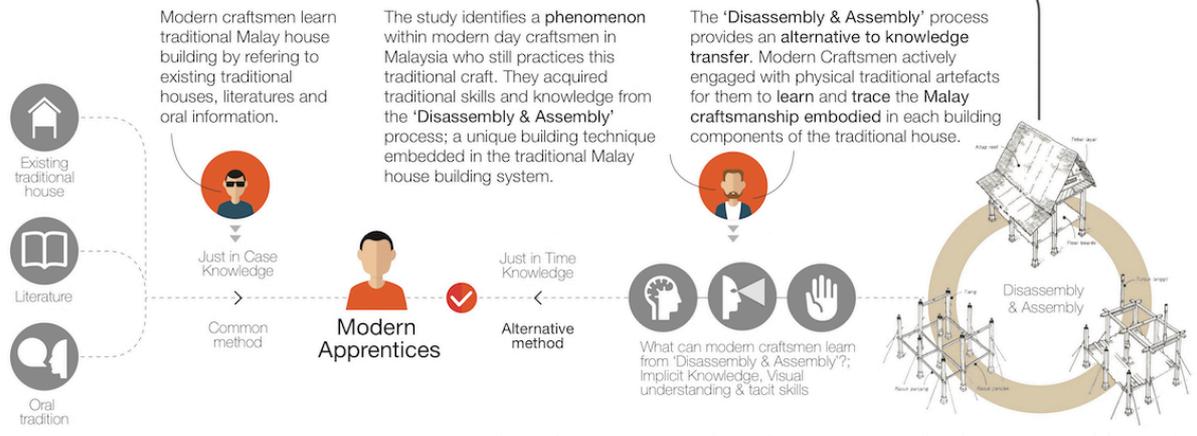


Development in the skills & knowledge of traditional Malay craftsmen of *tukang*



Skills, knowledge and beliefs evolve throughout history, contributing to the development of form, rituals and techniques in building Malay houses. Unfortunately, there is a **generation gap** between the master craftsmen with modern craftsmen and apprentices, leading to the **loss of indigenous Malay crafts legacies**.

What can we do to save the intangible legacy of Malay craftsmen or *tukang*?



Further reading:
 1) Hilton, R.N., 1992. Defining the Malay House. J. Malays. Branch R. Asiat. Soc. 65, 39-70.
 2) Waterson, R., 1997. The Living House: an Anthropology of Architecture in South-East Asia. Thames and Hudson, London.

Knowledge in Practice; New apprenticeships and the disassembly/ assembly of the traditional Malay house.

A traditional Malay house, built over generations by Malay master craftsmen or tukang, is a light wooden construction on structural stilts characterised by its small roofs typology. The house utilises a modular prefabrication construction system, which notably anticipates the 'disassembly and assembly' process, enabling future house extensions, dismantling and relocation in response to the Malay spiritual beliefs and cultural needs.

Taking UNESCO's definition of cultural heritage as a basis, the traditional Malay house constitutes both intangible and tangible aspects of Malay cultural heritage. While the latter refers to the architectural artefact, intangible heritage stresses the significance of Malay traditional craft knowledge, rituals and building skills that are often associated with magical beliefs and abstract symbolism.

Today, the indigenous knowledge of Malay house building is verging on disappearance as Malay tukang whom still practicing the traditional trade are now scarce, leaving a significant generation gap

that is leading to the loss of knowledge in traditional making. Knowledge of traditional building techniques is further deteriorated due to the ephemeral nature of oral knowledge transfer and the use of timber as building materials, thus contributing in the decline and negligence amongst locals.

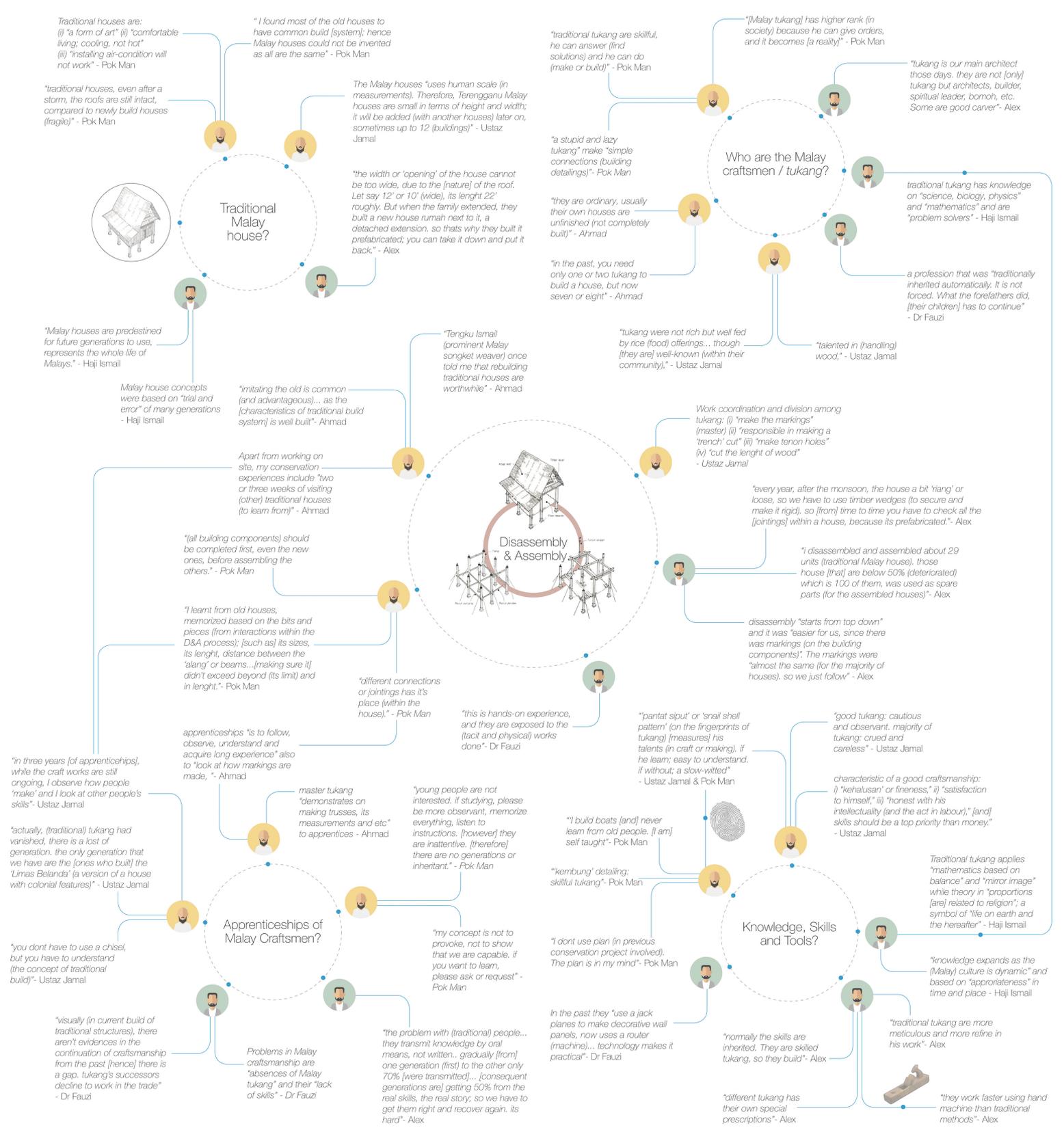
This study documents and evaluates a 'reverse-engineering' technique, observed during the author's fieldwork with modern-day Malay tukang, which exploits the 'disassembly and assembly' process of a Malay house as a tool to reveal evidence of rituals, indigenous and tacit knowledge embodied in each component of the house. This technique offers an alternative view on knowledge transfer, challenging the concept of apprenticeships that is normally associated by the hierarchy of labor between a Master craftsman and its apprentices. The knowledge transfer during the 'disassembly and assembly' process is central to the discovery of past Malay tukang's mastery and consequently encouraging new craft practices to evolve.



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The research poster summarizes the data collected from participant's interviews into specific themes, to illustrate the relationship of Malay craftsmen or tukang and the craftsmanship values within the topic of traditional Malay houses.

Legend: Malay craftsmen / tukang Conservator / Administrator



Reverse-Engineering Culture.

Rediscovering intangible heritage & traditional craft practices of Malay housebuilding

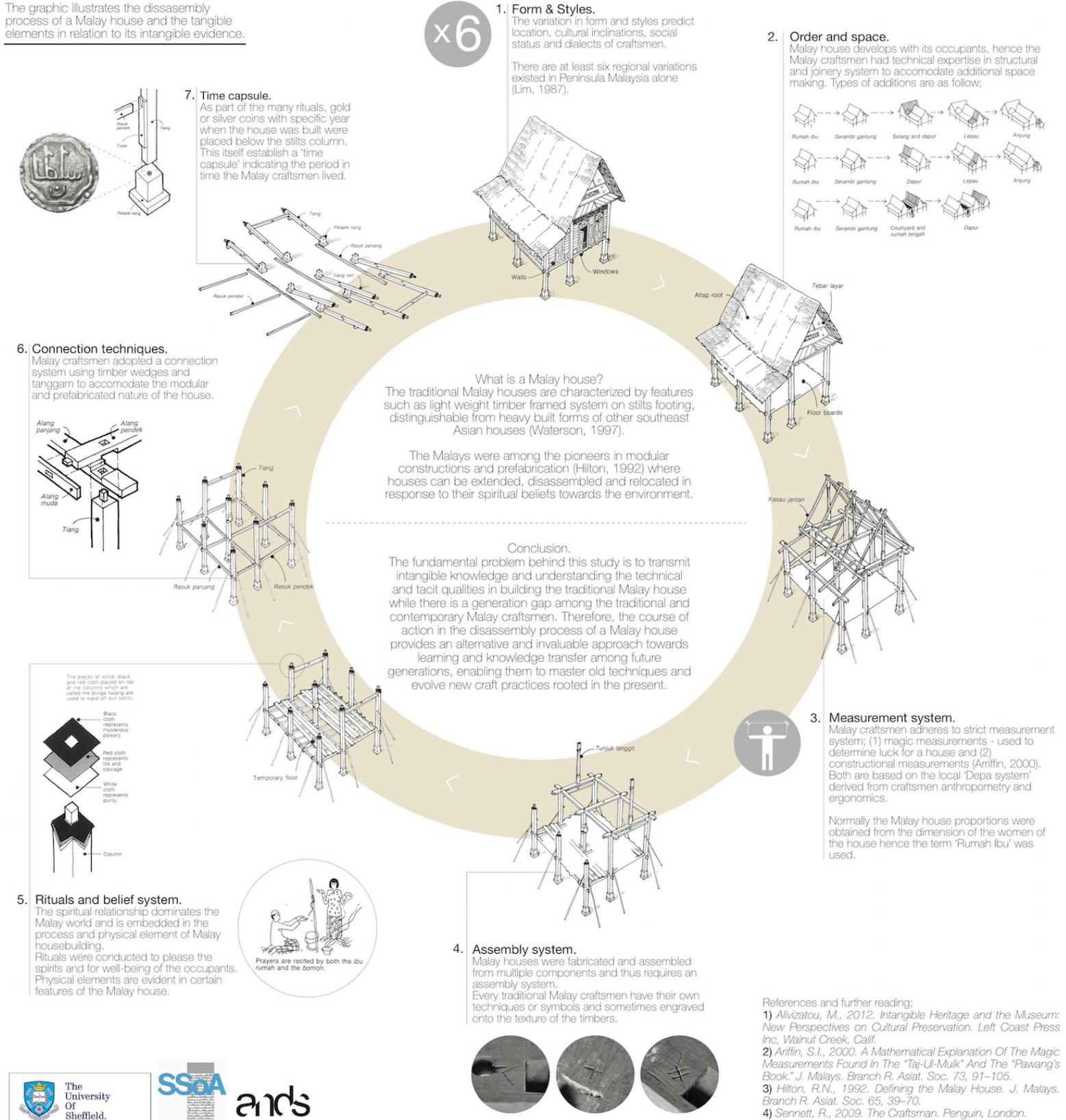
The graphic illustrates the disassembly process of a Malay house and the tangible elements in relation to its intangible evidence.

Introduction.
Traditional Malay house is a dying craft in Malaysia as contemporary building materials and techniques predominate the construction industry. The Malay house, built over generations by Malay master-craftsmen, represents the indigenous of the Malay society often associated with abstract beliefs and symbolism. Based on UNESCO's definition of cultural heritage, the Malay house constitutes both intangible and tangible aspect, acting as a symbol of Malay identity. While the latter delineate the preservation of the built form, intangible cultural heritage stresses the importance of the safeguarding, dissemination and reproduction of traditional craftsmen practices and knowledge in Malay house building.

a significant generation gap that is leading to the loss of knowledge in traditional making. In the past, practices of Malay house building include rituals and technical know-how which was based on an oral culture, hence the extinction of Malay craftsmen hints at a heritage processes of cultural stagnation (Alivizatou, 2012).

This study documents and evaluates a 'reverse-engineering' technique, an alternative view on knowledge transfer in contrast to the apprenticeship knowledge system. This notion was discovered during the author's fieldwork with modern Malay craftsmen, which exploits the disassembly process of a Malay house as a tool to reveal evidence of rituals, indigenous and tacit knowledge embedded in each component of the house. By adopting the Material Culture Theory, the house becomes the narratives of intangible cultural heritage processes.

A traditional Malay craftsman is bounded by the hierarchy of labour between a Master craftsman and its apprentices (Sennett, 2009), however as a forgotten trade, traditional Malay builders are now scarce, leaving



x6

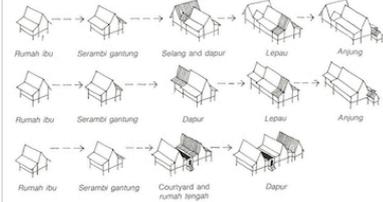
1. Form & Styles.

The variation in form and styles predict location, cultural inclinations, social status and dialects of craftsmen.

There are at least six regional variations existed in Peninsula Malaysia alone (Lim, 1987).

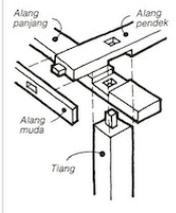
2. Order and space.

Malay house develops with its occupants, hence the Malay craftsmen had technical expertise in structural and joinery system to accommodate additional space making. Types of additions are as follow;



6. Connection techniques.

Malay craftsmen adopted a connection system using timber wedges and tanggam to accommodate the modular and prefabricated nature of the house.



5. Rituals and belief system.

The spiritual relationship dominates the Malay world and is embedded in the process and physical element of Malay housebuilding. Rituals were conducted to please the spirits and for well-being of the occupants. Physical elements are evident in certain features of the Malay house.



4. Assembly system.

Malay houses were fabricated and assembled from multiple components and thus requires an assembly system. Every traditional Malay craftsmen have their own techniques or symbols and sometimes engraved onto the texture of the timbers.



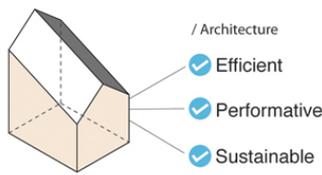
Images Ref: Author, 2015

3. Measurement system.

Malay craftsmen adheres to strict measurement system; (1) magic measurements - used to determine luck for a house and (2) constructional measurements (Ariffin, 2000). Both are based on the local 'Depa system' derived from craftsmen anthropometry and ergonomics.

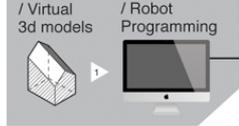
Normally the Malay house proportions were obtained from the dimension of the women of the house hence the term 'Rumah Ibu' was used.

References and further reading:
 1) Alivizatou, M., 2012. *Intangible Heritage and the Museum: New Perspectives on Cultural Preservation*. Left Coast Press Inc, Walnut Creek, Calif.
 2) Ariffin, S.I., 2000. *A Mathematical Explanation Of The Magic Measurements Found In The "Taj-Ui-Mulk" And The "Pawang's Book."* J. Malays. Branch R. Asiat. Soc. 73, 91-105.
 3) Hilton, R.N., 1992. *Defining the Malay House*. J. Malays. Branch R. Asiat. Soc. 65, 39-70.
 4) Sennett, R., 2009. *The Craftsman*. Penguin, London.
 5) Waterson, R., 1997. *The Living House: an Anthropology of architecture in South-East Asia*. Thames and Hudson, London.
 6) All images / figures edited and sourced from : Lim, J.Y., 1987. *The Malay house: Rediscovering Malaysia's Indigenous Shelter System*. Institut Masyarakat Pulau Pinang.

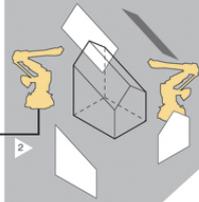


Prefabrication Process

// File-to-factory production



// Robots are used to produce components



Robot can be trained and taught skills, leading to the design of material processes.



Prefabrication in Architecture

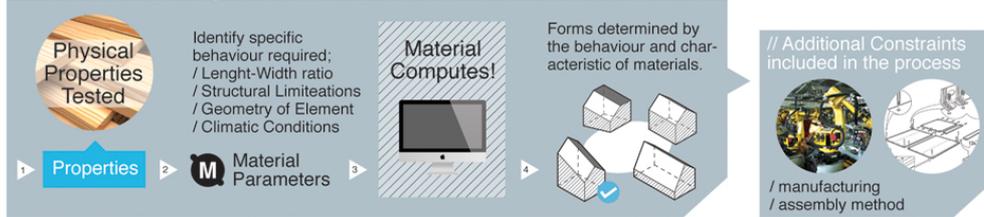


Inspired by automotive industry, architecture can now achieve variability in mass production prefabrication

"...materiality and materialisation can become the starting points of an exploratory, open-ended design process and thus serve quite literally, as the raw materials for design research and architectural inquiry."

Achim Menges

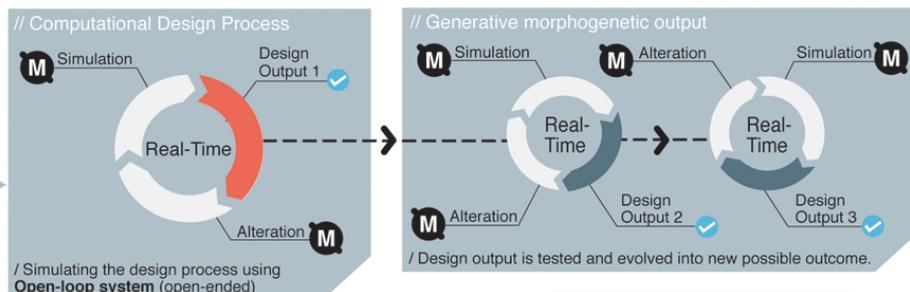
Material-based Design Process



Why Computational?

It allows to compute complex material elements and dynamic data sets into the process of design.

It also integrates the mechanized systems of manufacturing and prefabrication in the design exploration.

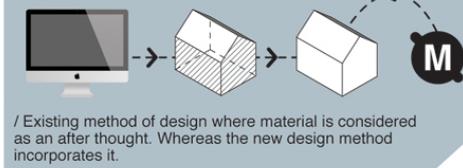


What is Material Computation?

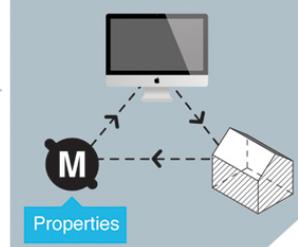
It is a material-based design that explores the potential of material properties to create architectural forms using computer capabilities.

The process converges the physical realisation of architecture (material) into virtual processes of computational design simultaneously and closer together.

// Material integration in design process



// New Material-design process



Digital Tools?

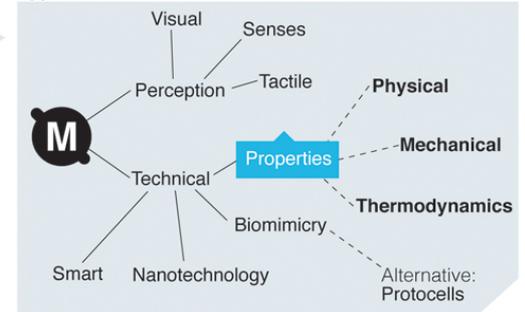
Any Digital Tools that goes beyond Computer Aided Design (CAD) and Building Information Modelling (BIM) that perform these functions;

- / Scripting
- / Programming
- / Parametric
- / Algorithmic
- / Genetic Algorithm

Why material?



Type of material?



Introduction

The poster presents a method of designing architecture using material as part of the process rather than consuming it afterwards, while taking advantage of prefabrication technique.

The approach is considered as a bottom-up strategy in the design term, hence the poster is literally displayed to be read the same way.

Reference
Menges, A., 2012. Material Computation: Higher Integration in Morphogenetic Design Architectural Design. John Wiley & Sons.

<http://www.chathamkulam.com/files/1331188754-Timber.jpg>
<http://www.themanufacturingconsultants.com/wp-content/uploads/2012/02/manu1.jpg>
http://www.neadinstructions.com/user_files/images_full/1_24415.JPG

Material Computation for Digital Fabrication of Architecture

Student : Aiman Mohd Rashid (amohdrashid1@sheffield.ac.uk) Supervisor : Dr. Mark Meagher

Bottom-up approach to Architecture!

