



Entrepreneurial Opportunity Creation in the Biotechnology Industry in Malaysia

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ABSTRACT

Entrepreneurship and opportunity are closely equated survivability among entrepreneurs. Many researchers have debated whether entrepreneurial opportunities are discovered or created. However, researchers have often overlooked the importance of the various factors that stimulate and shape the process of entrepreneurial opportunity. Adopting a case study method, this thesis includes in-depth interviews with nine biotech entrepreneurs to understand how they shape their activities in the event to create potential business opportunities. This study employs sensemaking theory with an interpretive approach to data analysis. Theoretically, the study demonstrates that individual, institutional support and socio-cultural forces affect the process by which profit opportunities are recognized and created. Three specific lessons learned from the case. First lesson is the importance of passion in influencing the desires, thoughts, plans, and behaviours and that persist over time, regardless of cost, external obstacles and moral objections towards achieving entrepreneurial success.

Secondly, prior knowledge and career experience enable entrepreneurs to identify niche opportunities, build up networks of contacts and develop skills, and consequently they confer an ability to recognize the value of new information, to learn, and to apply it to new commercial ends. The regulatory dimensions of an institutional forces consists of regulations and government policies that provide support for new businesses, reduce the risks for individuals starting a new company and facilitate entrepreneurs' efforts to acquire resources. The theoretical framework of this study makes it possible to see the link between entrepreneurs' ability to utilize limited resources to gain access to valuable key information and decisions, and their creation of sensible actions to recognize business opportunities. Hence, this study is expected to contribute significantly to the wealth of academic literatures in the subject of entrepreneurial opportunity. Thirdly, this study also plays an essential role to provide recommendations for policy makers to foster and encourage entrepreneurship through targeted and specific policy initiatives by fully understanding the elements that contributes to the success of entrepreneurial opportunity creation process in Malaysia.

Keywords: Entrepreneurial opportunities; discovery; creation; sensemaking; interpretive approach

DEDICATION

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Chapter One

Locating the Research Foundation

1.0 Introduction

This chapter introduces the structure of the thesis by providing the context and foundation of the research investigation. The research discussions cover several key elements framing the empirical focus of this study. This includes framing the investigation with the concepts of entrepreneurial opportunity and sensemaking theories. The aim of this chapter is to provide empirical context to the area of study of biotechnology industry in Malaysia. This chapter also sets out the aims, the objectives and the conceptual approach of the thesis. Finally, this chapter explains where and how this research is conducted and concludes it by providing the thesis organization.

1.1 Framing the Context of the Study

The term 'entrepreneur' originates from the French word 'entreprendre', which means "to do something" (Swedberg, 2000) or "to undertake" (Kuratko & Hodgets, 2001). This term was first introduced by Richard Cantillon, an Irish banker in Paris, through his essay 'Essai sur la nature du commerce' (1755) which was published twenty years after his death (Grebel et al, 2003). Cantillon advances the notion that entrepreneurs are economic agents who have the foresight and willingness to take advantage of unrealized profit opportunities through buying and selling activities (Blaug, 2000). In a business context, it means to start a business. Joseph Schumpeter defined entrepreneurship as "the assumption of risk and responsibility in designing and implementing a business strategy or starting a business" (Schumpeter 1911). J.W Gough stated that entrepreneurship "refers to a person who undertakes and operates a new enterprise or venture, and assumes some accountability for the inherent risks" (Gough, 1969). For practitioners, entrepreneurship has generally been viewed as the process of creating new wealth. Researchers define the entrepreneurship phenomenon differently and often use different terms interchangeably (Zahra, Jennings, & Kuratko, 1999). Shane and Venkataraman (2000) offered an interesting interpretation of entrepreneurship by suggesting the definition of entrepreneurship "as the scholarly examination of how, by whom and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited." Their interpretation emphasizes the importance of opportunities in entrepreneurship study.

It is noted that early discussions on entrepreneurship centered on the critical role of the entrepreneur in facilitating resources in a state of perpetual disequilibrium. This area of concern was pioneered by the founding father of what is referred to as 'the Austrian School' of entrepreneurship, Carl Menger (1950). In his research, Menger described the role that entrepreneurs adopted to manage business resources such as capital, labour, and knowledge of the perpetual disequilibrium situation in business environments. In the development of entrepreneurship research, Ucbasaran et al (2001) identified six major themes which are mainly discussed by scholars, namely; (1) Entrepreneurship theory; (2) Types of entrepreneurs; (3) The entrepreneurial process; (4) Organizational forms selected by entrepreneurs; (5) External environments for entrepreneurship; and (6) Outcomes. Ventakaraman (1997) argued that one of the most neglected questions in entrepreneurship research is where do opportunities come from. Further questions; why, when and how certain individuals exploit opportunities, appear to be a function of the joint characteristics of the opportunity and the nature of the individual (Shane & Ventakaraman 2000). Ventakaraman (1997) highlighted three main areas that differentiate between individuals that recognize opportunities and those who do not. They are namely, (1) knowledge (and information) differences; (2) cognitive differences; and (3) behavioral differences. According to Kirzner (1973), an entrepreneur identifies opportunities by being "alert" to and "noticing" opportunities that are present in the market. The process of search and opportunity recognition can be influenced by the cognitive behavior of entrepreneurs.

Many of those researching entrepreneurship studies are trying to make sense of entrepreneurship opportunity as a field of research and thus view it from different perspectives. Shane and Venkataraman (2000) have argued that entrepreneurial opportunities are 'objective phenomena', existing in time and space even though all people may not know them always. Thus, opportunities exist, waiting for the alert (or knowledgeable and attuned) individuals to recognize them (Kirzner, 1973). However Companies and McMullen (2007) hold the view that entrepreneurial opportunity is more accurately described as an opportunity to engage in entrepreneurial action, where entrepreneurial opportunity denotes a subclass of some broader category of human action, as all human action is arguably motivated by profit (Homans, 1964). This is consistent with Shane and Venkataraman (2000), who borrow from Casson to define entrepreneurial opportunities as objective situations that entail the discovery of new means–ends relationships through which new goods, services, raw materials, and organizing methods can be introduced to produce economic value (p. 5). Most studies on entrepreneurial opportunities were built on the earlier work of Kirzner (1973). Kirzner for instance emphasizes the equilibrating role of entrepreneurship and he takes the view that the market is not in equilibrium, that profit

opportunities exist, and that entrepreneurs discover and act on these profit opportunities to equilibrate the market. However, Kirzner focuses only on entrepreneurial actions when profit opportunities exist, and does not describe where they come from and how entrepreneurs use them to their advantage. Venkataraman (1997) later explained entrepreneurship as the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited. Hence, a growing number of researchers define the domain of the entrepreneurship field as centering on opportunity recognition, evaluation, and exploitation (Aldrich & Ruef, 2006; Shane & Venkataraman, 2000; Venkataraman, 1997).

This definition is not at all universally accepted, although scholars widely acknowledge that the theoretical development of the opportunity construct is central to entrepreneurship as a domain of academic inquiry, while questions focusing on the origins of opportunity remain largely unanswered, to the dissatisfaction of many (Gaglio & Katz, 2001). Although a few scholars disagree that a common definition of entrepreneurship would speed the intellectual development of the field (Katz, 2008), most scholars agree that the development of a common definition is necessary for the field to advance (Koster, 2006). Although scholars have begun to provide information about the sources and nature of entrepreneurial opportunities, they have done little work in identifying the process of entrepreneurial opportunities. This thesis is centred on the entrepreneurial opportunity process, which is defined as a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them' (Sarasvathy et al., 2003:142), providing the context of the discussion.

1.2 Theoretical Perspectives on Entrepreneurial Opportunity

Acs & Audretsch, (2003) outline the benefits of engaging in discussions on whether opportunities are discovered or created by entrepreneurs. The discussion argues by addressing entrepreneurial action, the action that drives entrepreneurs to seek and exploit opportunities. The theory of entrepreneurial action explains human behaviour by looking at the impact of that behaviour on the ability of individuals to accomplish their purposes (Alvarez & Barney, 2007) and in the context of this thesis, to explain the process of how entrepreneurs discover and create opportunities. The discovery and creation views seek to explain the same issues – actions that entrepreneurs take to form and exploit opportunities (Shane, 2003; Shane & Venkataraman, 2000). Both of these views have much in common. However, these views generate different predictions about the specific contexts on the drivers of entrepreneurs to effectively execute opportunities. Further, between these two,

discovery theory has received much attention in the literature (Gaglio and Katz, 2001; Shane, 2003; Venkataraman, 2003). The following discussion will revolve around the opposing views that form the debate in the entrepreneurial opportunity creation area, namely the discovery and the creation views.

1.3 The Discovery View

The discovery view has its roots in Austrian economics (Kirzner, 1997). In this view, competitive imperfections are assumed to arise exogenously from changes in technology, consumer preferences, or some other attributes of the context within which an industry or market exists (Kirzner, 1973). Shane (2003), in his review of the literature, cites technological changes, political and regulatory changes, and social and demographic changes as examples of the kinds of events that can disrupt the competitive equilibrium that exists in a market or industry, thereby forming opportunities. Here Shane indicates that exogenous shocks form opportunities and these have strong implications for the discovery view. For example, this emphasis suggests that discovery theory is based on realistic assumptions in the philosophy of science – that opportunities, like mountains, exist as real and objective phenomena, independent of the actions or perceptions of entrepreneurs, just waiting to be discovered and exploited (McKelvey, 1999). However, it is the entrepreneurs who bring ‘agency to opportunity’ (Shane, 2003), in the sense that they exploit them (the opportunities). The view that exogenous shocks form opportunities also suggests that the discovery view is predominantly about search – systematically scanning the environment to discover opportunities to produce new products or services.

It is imperative that the discovery view assumes that entrepreneurs who discover opportunities are significantly different from others in their ability to either see opportunities or, once they are seen, to exploit them (Kirzner, 1973; Shane, 2003). These different qualities that separate entrepreneurs from the non-entrepreneurs are summarized by Kirzner (1973:67) in his notion known as ‘alertness’. Alertness reflects the entrepreneur’s prior knowledge (Kirzner, 1973, 1997; Shane, 2000) and prior knowledge, argued Zahra (2008), heightens the entrepreneur’s alertness to potential opportunities. In the context of this thesis and biotechnology, through combining different types of knowledge (including prior knowledge) entrepreneurs, including biotechnologists, sometimes make technological and scientific breakthroughs, including some that could even be accidental.

1.4 The Creation View

Alternatively, the creation view also attempts to explain entrepreneurs' actions in forming and exploiting opportunities (Aldrich & Ruef, 2006; Gartner, 1993; Venkataraman 2003). This view suggests that opportunities do not necessarily evolve out of pre-existing industries or markets (Etzioni, 1963). Additionally, the term 'search' has little or no meaning in creation theory (Alvarez & Barney, 2007). In fact, the creation view suggests that entrepreneurs do not search; they act and they observe how consumers and markets respond to their actions. Creation involves a great deal more than simply recognizing opportunities that already exist; it requires sensing, developing, evaluating, and reframing opportunities (O'Connor & Rice, 2000). Instead of being passive recipients to the formation of new opportunities, the creation view assumes that entrepreneurs' actions are the essential source of these opportunities – they build the mountain (Alvarez & Barney, 2007). The view that the creationist is not a passive recipient to the formation of new opportunities supports Baker and Nelson (2005), Bhide (1999) and Sarasvathy's (2001) notions, who argue that entrepreneurs do not wait for exogenous shocks to form opportunities and then provide an agency with those opportunities; instead they act. This argument is also in agreement with the view that suggests that opportunities do not pre-exist and that the entrepreneur actively creates the external circumstances and the opportunity (Fletcher 2006; Gartner et al. 2003; Sarasvathy 2008). However, despite efforts to introduce ideas such as creativity (Dimov, 2007), enactment (Gartner et al., 2003), effectuation (Sarasvathy, 2001), and social construction (Fletcher, 2006), the creation view has yet to produce a complete and fully developed alternative framework (Alvarez & Barney, 2007). Zahra (2008), for example, adds value to the theoretical discussion in which he states the integrated view of discovery and creation could address the weaknesses of both discovery and creation views.

Zahra (2008) in his empirical study in technologically advanced and sophisticated markets, attempted to explain why certain contexts are more conducive to discovery while others promote the discovery and creation of opportunities. He posits that opportunity is created through science and technological development and the opportunities that emerge from such a process are worthwhile because imitation is slow. Zahra further added that as the science becomes better developed, additional business opportunities are created, alongside the development of process innovation to build on emerging scientific findings and the employment of new mechanisms to embed science into existing products, systems and process. Zahra (2008) claims that both the discovery and creation of entrepreneurial opportunities play important and reciprocal roles, exhibiting different search processes, and forming a self-regenerating and reinforcing dynamic cycle where discovery promotes future

creation, and vice versa. Additionally, the model of discovery–creation – a virtual cycle of opportunity recognition – illustrates that the discovery of opportunities can spark additional discoveries, and this exists on the stage for exploiting a process that entails considerable trial and error learning (Zahra et al., 2006). In short, creation can stimulate the discovery of more and varied entrepreneurial opportunities. Consequently, exploitation can also lead to the discovery or creation of opportunities (Zahra, 2008). Despite all the arguments and discussions of entrepreneurial opportunities (Shane, 2003, Aldrich & Ruef, 2006; Gartner, 1993; Venkataraman 2003, Zahra, 2008) research has not provided a compelling explanation for the ability of entrepreneurs to continuously create, define, discover and exploit entrepreneurial opportunities. This thesis helps to explain by investigating how entrepreneurial opportunities are discovered and created in the Malaysian biotechnology context.

1.5 Importance of the Study

In addition, many of the studies, which examine similar issues, only focus on developed countries such as the UK, the US and Australia (Smallbone *et al* 1995; Boardman *et al* 1981; Chaston & Mangles 1997). Thus, there are demands for more advanced studies on entrepreneurship and biotechnology, especially in the developing countries. This thesis examines nine case studies drawn from this research of biotech entrepreneurs to provide a greater understanding as to how these entrepreneurs demonstrates key ideas while defining the concepts of opportunity discovery and creation in Malaysia. Fletcher (2006) suggests that 'entrepreneurship is hardly a newly emerging field suffering from immaturity, adolescence and the 'liability of newness'. But when it comes to understandings of how and why business ideas 'locate' with particular individuals at particular points, she views that entrepreneurship is still fairly underdeveloped'. This study aims to fill this gap. Its purpose is to explore how opportunities are discovered and created by biotech entrepreneurs. This chapter demonstrates the importance of the growing biotechnology industry as one of the engines of economic growth stimulating entrepreneurial activity; hence influencing the researcher to investigate the idea of entrepreneurial opportunity in Malaysia. Drawing on Weick's (1995 & 2001) sensemaking theory, this thesis develops an entrepreneurial opportunity model to uncover entrepreneur's role and actions as opportunity creators in Malaysia.

1.6 The Role of Biotechnology as a Focus of Study

Biotechnology is defined as 'the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the

production of knowledge, goods and services' (OECD, 2006). While, the biotechnology industry is an industry made up of entrepreneurial life science companies which use modern biological techniques to develop products or services to serve the needs of human healthcare or animal health, agriculture productivity, food processing, renewable resources or environmental affairs' (Ernst & Young, 2000). The importance of biotechnology as one of the engines of economic growth is eminent. Simon and Kotler (2003), for an example, conclude that one third of the world's Gross Domestic Product (GDP) is generated by biotechnology and related industries. The biotechnology sector also continues to grow by about 10 to 15 per cent globally, reaching US\$271 billion in 2011 with the healthcare segment as the largest contributor to the overall biotechnology sector revenues (Frost & Sullivan, 2009). This suggests that the industry remains an important contributor to the economic growth of a country. The significant increase in the growth of this industry signals that it is not only big and multinational corporations that benefit from the industry but also small entrepreneurial firms.

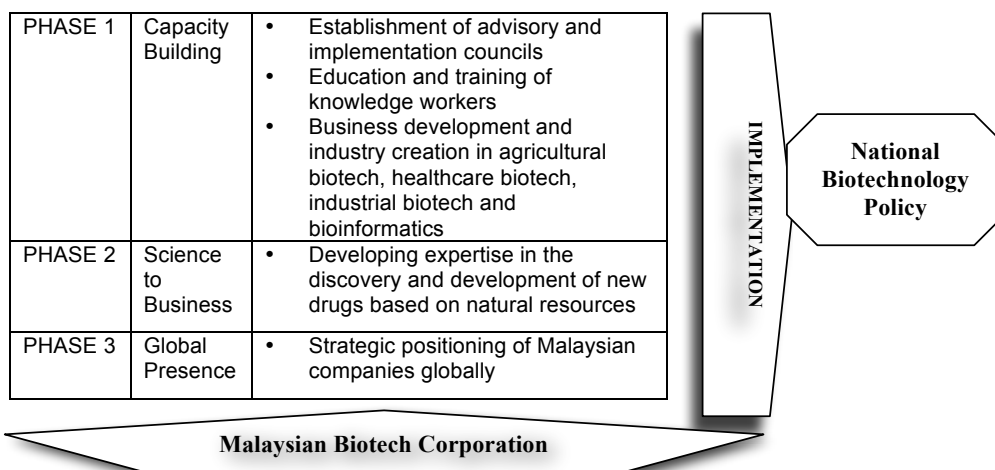
Malaysia, acknowledged that biotechnology is the engine of growth for life sciences in the 21st century (BIOTEK, 2001), by creating platforms for new products and markets on many fronts (Ernst & Young, 2000). Though still relatively new and limited in terms of scope, biotechnology has been recognized as one of the key drivers of Malaysia's economic future. As emphasized by the former Prime Minister of Malaysia, Abdullah Badawi: "Malaysia possesses the richest biodiversity on the planet. It is a gift; a competitive advantage that is God-given and we must find ways to harvest it to the best of our abilities" (Badawi 2003, p. 3). During the sixties, the economy of Malaysia encompassed mainly agricultural activities and commodities. However, today, Malaysia comfortably poised itself to become an export-driven nation, propelled by high technology, knowledge-based and capital-intensive industries. Malaysia has been ranked the fifth most competitive economy in Asia, following Singapore, Hong Kong, Taiwan and China, and the nineteenth worldwide (Schwab & Porter, 2008). Malaysia has gradually established and exploited the competitive advantages of the biotechnology industry.

Five competitive advantages of biotechnology in Malaysia have been identified by Gomez (2005): Malaysia's rich diversity of flora, fauna and people; the already existing agriculture-based biotechnology; the increasing number of government grants and venture capital funding; the existence of an ICT infrastructure and experience in the high-technology industry; and the government's unrelenting commitment to biotechnology. Gomez (2005) further adds that Malaysia has around 4.06 million hectares of agricultural land distributed throughout its 14 states and approximately 75 per cent of this land is cultivated with primary

crops such as palm oil, rubber, cocoa, coconut and pepper, while the remaining portion is dedicated to agro-food production. Malaysia has moved from an agriculture-based economy, with the agriculture sector as its main thrust during the early 1960s, to an industrial economy in the 2000s, with the manufacturing sector and service sectors as its main thrusts. Also, according to Gomez (2005), the real value of the agriculture sector had risen from RM33 billion in 2003 to RM40 billion in 2008, producing a total of 7258 agricultural business entrepreneurs. Nevertheless, this shapes the birth to the introduction of biotechnology industry in Malaysia. This has been made possible through the establishment in 1995 of the National Biotechnology Directorate or BIOTEK, a division of the Ministry of Science, Technology and Innovation, with the aims to capacity building, developing expertise in the discovery and development of new drugs based on natural resources and strategic positioning of Malaysian companies globally (see Diagram 1.1: National Biotechnology Policy).

Diagram 1.1: National Biotechnology Policy

PHASES INITIATIVES OPERATIONAL STRATEGIES



The Malaysian government has established the (MBC), a government-linked institution, to administer government policies, advance the commercialization of biotechnology initiatives, and assist interested companies and investors. MBC as an agency was established on 13th May 2005, under the purview of the former Ministry of Science, Technology and Innovation (the Ministry was later renamed the Ministry of Energy and Green Technology). Here, the establishment of the MBC is to identify value propositions in both research and development and to engage active participations of the public into entrepreneurial initiatives hence to stimulate the sub-segments of the biotechnology industry, such as healthcare biotech, agricultural biotech, industrial biotech and Bioinformatics. From 2005 to the end of 2007,

MBC facilitated approved investments of close to RM1 billion to 19 biotech companies in healthcare, 15 in agriculture, 6 in industry and 2 in Bioinformatics, making a total of 42 companies (MBC, 2009), and thus this serves as an important reason why this thesis structure is initiated. It is intended that this study will generate useful inputs for the Malaysian government to propose better and effective entrepreneurship policy on ways to develop entrepreneurial initiatives and programs and to provide impetus for the future research on entrepreneurial opportunity process.

1.7 Research Objectives

The first objective of this study is to investigate the literature by examining and analyzing issues associated with processes of entrepreneurial opportunity discovery and creation in Malaysia. The study aims to understand the opportunity discovery and creative processes, which is shaped by individual, institutional and social cultural forces, in terms of how entrepreneurs make sense of their situation, and how they interpret business interactions. This analytical framing will facilitate an understanding of how entrepreneurs discover and enact business opportunities, identify what this process means to them and how it is rendered visible through their actions and interactions. The second objective is to identify relevant factors that shape entrepreneurs into opportunity driven activities using an interpretive approach. This is to gain a more advanced understanding of why and how entrepreneurs recognize and create opportunities. Thirdly, an additional objective is to explore the implications of this study, particularly in the biotech industry in guiding the entrepreneurs to promote better and effective entrepreneurial initiatives for them.

1.8 Research Questions

The primary focus of this study is opportunity recognition and creation processes as spoken of by entrepreneurs in the biotech industry in Malaysia. The study draws on Weick's (1995 & 2001) conceptualization of sensemaking. Sensemaking as a concept was initiated in the field of social psychology and has spread to a number of fields, including management and organization theory (e.g. Weber and Manning 2001, Gioia and Chittipeddi, 1991). Karl Weick is a primary promoter on sensemaking as a socio-cognitive process within organization's research. Weick describes sensemaking as 'the concept well named because, literally, it means the making of sense. Active agents construct sensible, sensible events. They "structure the un-known" (Weick 1995, p. 4).

How entrepreneurs make sense of situations and events determines their actions to discover and create a considerable amount of activities favorable to profit opportunities. The role of sensemaking in this study is to bring entrepreneurs into the context of interpreting their experiences and actions within the environments. The analysis of this study is guided by the seven organizational sensemaking properties promoted by Karl Weick (1995). These properties are: (1) grounded in identity construction; (2) retrospective in terms of meaning; (3) always ongoing; (4) focused on and by extracting clues; (5) part of a social process; (6) driven by plausibility; and (7) inactive of sensitive environments.

To summarize, sensemaking properties demonstrate the underlying theoretical/conceptual framework of this study. This thesis illustrates how each one of the seven organizational sensemaking properties is refined into an entrepreneurship perspective, shaped by the three major forces – individual, institutional support and sociocultural. The model explains that entrepreneurs who think they are in their context defines what they enact and how they interpret events/actions. Hence, this constitutes an entrepreneur's identity. The enactment of sensible environments suggests that entrepreneurs discover and create opportunities within the environments they face, in dialogues and narratives. Furthermore, the conceptual model proposes that entrepreneurs react and take action based on precedence over accuracy; this suggests that entrepreneurs extract valuable cues from valuable sources within the environments, in the form of market research and personal interactions and networks. The model also suggests that entrepreneurs prefer plausibility over accuracy in accounts of events and context, to discover and create opportunities. It is demonstrated how sensemaking is a social process (Weick, 2001), suggesting that what entrepreneurs say, single out and conclude, are determined by various social factors including values and belief systems. In the context of this study, sensemaking properties are all interrelated and are part of an ongoing process which never starts or stops. The conceptual framework of this study helps to examine the issue of entrepreneurial opportunity discovery/creation, thus addressing the main research question which is: How do entrepreneurs discover and create opportunities in the context of the biotechnology industry in Malaysia.

1.9 Research Design

The study first begins by examining the existing literature in the area of entrepreneurship in general, and on entrepreneurial opportunity discovery and creation in particular, to set a foundation for the theoretical perspectives and context of the study. The literature search was also used to identify how this study fits with past studies and to single out relevant

issues pertaining to the research question posed by the study. The primary source of empirical data for this study was developed through a series of semi-structured qualitative interviews. The interviews were conducted within biotechnology firms in Malaysia. In this context of study, biotechnology firm can be defined as a firm that is engaged in biotechnology by using at least one biotechnology technique to produce goods or services and/or to perform biotechnology research and development' (OECD, 2009). According to the OECD, there are two subgroups of biotechnology firms; 1. Dedicated biotechnology firm: defined as a biotechnology firm whose predominant activity involves the application of biotechnology techniques to produce goods or services and/or to perform biotechnology research and development and 2. Biotechnology research and development firm: defined as a firm that performs biotechnology research and development.

The respondents include entrepreneurs from three different areas of the biotechnology industry: government funded entrepreneurs, personally funded entrepreneurs and family business funded entrepreneurs. The three categories were chosen in order to allow the researcher to examine the key themes of opportunity discovery and opportunity creation. These interviews were complemented by in-depth interviews and personal observations with biotech entrepreneurs. The combinations of the interviews with the in-depth interviews and personal observations were beneficial and insightful for the purpose of this study. This study also utilizes publicly accessible government documents and publications, and industry reports made available by the Malaysian Biotechnology Corporation (MBC) in order to gather important information about past, present and future issues in the biotech industry.

1.10 Thesis Organization

Chapter One provides the substantive context of investigation for the whole thesis. This evolves by locating various views of entrepreneurial opportunity in the central discussions of entrepreneurship research. The perspectives on opportunity discovery and creation are discussed together with the importance of biotechnology in the context of the thesis. This chapter also elaborates the aims, objectives and research questions. The whole thesis works within the context of addressing the process of entrepreneurial opportunity recognition and creation and is connected to sensemaking as the key theoretical framework.

Building on the theories of entrepreneurial opportunity, Chapter Two presents an analysis of past studies that constitute four main elements of this research study. The discussions explore the historical development of entrepreneurship research and the main streams of

entrepreneurship research. This discussion covers a wide range of arguments on related issues such as the effects of the individual, institutional supports and sociocultural influences on entrepreneurship activities and causes of entrepreneurial opportunity creation. Chapter Two outlines an alternative view to sensemaking theory that is, 'effectual' entrepreneurship theory. This chapter analyses sensemaking theory and effectual entrepreneurship theory by identifying the key elements of both theories. The chapter advances by locating sensemaking as the theoretical vehicle for this research and elaborating the conceptual framework by identifying the key antecedents and factors that form the core principles of the research. Chapter Two concludes by providing a synthesis of the existing literature in order to shape the foundation of this thesis and how it might add on to what has been written about the subject.

In chapter three, the relevant studies are identified that outline entrepreneurship studies in the biotechnology industry. The researcher examined articles involving entrepreneurship in biotechnology that were published in PhD theses, databases, and highly cited entrepreneurship journals, including "the Big 5" (Katz 2003): *Entrepreneurship and Regional Development*; *Entrepreneurship: Theory and Practice*; *Journal of Business Venturing*; *Journal of Small Business Management*; and *Small Business Economics*. Building on the earlier investigations on the views and different antecedents that affect entrepreneurial opportunity, this chapter positions entrepreneurial opportunity in the center of the analysis of the biotech studies.

Chapter Four outlines the research methodology and research design of the study. Research design issues involve the development of a framework for the collection and analysis of data, and reflects decisions about the priority given to a range of dimensions of the research process (Bryman, 2008). This chapter discusses why and how the methodological approaches chosen for the study were operationalised. It includes the methodological considerations, how the methodologies were applied and the chosen research design for the study. The key aims of the research methodology and research design were to investigate how biotechnology entrepreneurs discover and create entrepreneurial opportunities. Incorporating and extending the works of Shane and Venkataraman (2000) on entrepreneurial opportunities, this thesis investigates how individual, institutional support and socio-demographic forces shapes entrepreneurial opportunities. Chapter Four concludes with the discussion on the step-by-step process of data collection and data analysis.

Chapters Five, Six and Seven analyze and critically evaluate the empirical findings from the study of nine biotech entrepreneurs in Malaysia. This includes the fieldwork drawn from interviewing nine carefully selected biotech entrepreneurs from three different categories (namely government funded entrepreneurs, personally funded entrepreneurs and family funded entrepreneurs). The rationale for this choice is to identify different patterns emerging from different categories of entrepreneurs. For the purpose of case selections, the thesis adopts the 'snowball or chain sampling' method, which identifies cases from people who know people who know what cases are information-rich, that is, good examples for study or good interview subjects (Patton, 1990:182). The nine cases in Chapter 5,6 and 7 illustrate the process of opportunity enactment within the influence of three dominant forces of individual and institutional support and sociocultural forces. The importance of appropriate institutional support mechanisms for biotech entrepreneurs and their values and belief systems are also covered.

Chapter Eight presents the (cross case or comparative) in-depth analysis of the family funded, government funded, and personally funded cases of biotech entrepreneurs in Malaysia. It also demonstrates how the key themes of individual, institutional, and sociocultural forces link to and corroborates the sensemaking notion. The in-depth analysis in this chapter explains how the individual entrepreneurs in these cases recognize or create opportunities from the sensemaking perspective. The first case is Power Biotechnologies (PBT), the second is Rrass Bakti (BRB) and the last is Innobiologics (INB). They were selected based on certain identified characteristics that enabled the researcher to analyze more deeply the phenomena of opportunity recognition and opportunity creation. Additionally, the selection of the cases provides more in depth understanding of the investigated area of entrepreneurship discovery and creation. They also help to confirm sensemaking more than other cases. The two characteristics of case selection are firstly, agreement by and access to the respondent's participants, and secondly, data collection and the nature of active and long involvement in entrepreneurial activities such as business involvement, prior knowledge and career experience and the maintaining of active social and institutional relationships. Finally, Chapter Nine demonstrates the key contributions of the thesis in the area of entrepreneurship, with practical, methodological and policy implications. This is summarized and presented in the abstract of the thesis. This final chapter concludes by elaborating the research limitations and suggesting recommendations for future research.

Chapter Two

The Literature Reviews on Opportunity Discovery and Creation

2.0 Introduction

As explained in the introductory chapter, the theoretical framework of this research is built on the conceptual framework of entrepreneurial opportunity and sensemaking (Weick, 1985) and this chapter seeks to explain the arguments of entrepreneurial opportunity. In doing so, this chapter starts by providing general overview analysis of the development of entrepreneurship. This is followed by analysis of different views and studies on entrepreneurial opportunity from the contexts of individual, institutional and sociocultural forces. The aim of the analysis is to locate current and important issues debated in the area of entrepreneurial opportunity hence providing foundation to the context of the research. This chapter also covers a wide range of arguments, including both the discovery and creation views of entrepreneurial opportunities. These arguments help outlines the key dimensions of the entrepreneurial opportunity processes. Further to the research framework discussion, the researcher explains the driving theory behind this research, namely sensemaking theory. This involves explaining the role and limitations of sensemaking theory compared to other concept/theory used as the theoretical framework. The chapter ends with a proposed framework to be used as a guide for this research that links to the all elements as found in the literatures.

2.1 The Development of Entrepreneurship Research

Entrepreneurship research evolves dramatically. Earlier arguments on entrepreneurship study, promotes the issue of how entrepreneur uses their limited resources in a state of perpetual disequilibrium. This area of concern was pioneered by the founding father of 'the Austrian school' of entrepreneurship, Carl Menger (1950). In his research, Menger described the role that entrepreneurs adopted to manage business resources such as capital, labor, and knowledge of the perpetual disequilibrium situation in business environments. Menger (1950) even stressed the importance of entrepreneurs in possessing information and analyzing that information successfully in order to allocate resources accurately. The development of entrepreneur's discussion on managing different resources in the state of perpetual disequilibrium has influenced many scholarly studies that try to investigate the understanding of entrepreneurial action. In doing so, researchers including Kirzner (1973) helps explain the role of individual alertness and superior perception of entrepreneurs, in exploiting available resources for profit opportunities.

Kirzner (1973) posits that it is the alertness and superior perception of entrepreneurs that cause factors of production to be reallocated towards an equilibrium condition. He also argues that the ownership of capital is not necessary to provoke its movement or change of application. He later introduces the notion of the 'pure entrepreneur' by saying that the pure entrepreneur is 'a decision-maker whose entire role arises out of his alertness to hitherto unnoticed opportunities' (Kirzner 1979:38–9). Hence, this suggests that entrepreneurs develop special characteristics that others don't to identify the unnoticed opportunities. Schumpeter (1934) opined that the entrepreneur's special characteristics, such as risk taking and managing resources, cause economic changes in the state of disequilibrium, while elements such as socio-demographic factors, politics, and the economy open up many business opportunities to entrepreneurs. These, he stated, open much space among entrepreneurs and entrepreneurship researchers to explore the issues involving entrepreneurial activities. Drucker (1986) claims that entrepreneurship is not restricted to one group of individuals, and entrepreneurs are not born with specific sets of characteristics. Instead, he argues that entrepreneurial behavior can be developed among individuals of existing business organizations to provide a competitive advantage. Drucker's notion suggests that entrepreneurs are not born unique from the others. Rather, they can be trained and formed. Therefore, Drucker's view implies that entrepreneurs are ordinary human beings possessing certain attitudes and behaviors, and many researchers are interested in how these entrepreneurs' attitudes and behaviors stimulate the opportunity discovery and the creation process for profit opportunities.

Shane (2003) posits that the development of entrepreneurship research can be summarized into two groups: those who want the field of entrepreneurship to focus exclusively on individuals and those who want the field of entrepreneurship to focus exclusively on external forces. He argues that a large number of entrepreneurship researchers have sought to explain the entrepreneurial phenomenon by identifying those members of society who could be considered 'entrepreneurial individuals'. The large numbers of researchers who fall into the first group generally focus on explaining entrepreneurship as a function of core human attributes, such as the willingness to bear uncertainty (Khilstrom & Lafont, 1979), tolerance for ambiguity (Schere, 1982) or the need for achievement (McClelland, 1961), which differentiates entrepreneurs from the rest of society. Thus, this group of researchers tries to investigate issues such as what motivates a person to be an entrepreneur and whether those who fall into this category have a different personality from non-entrepreneurs. Hence, entrepreneurship researchers also have to use the research methods in a more scientific study of human behavior, which is to test and see their behavior in a controlled environment such as in the laboratory, to get the answers to issues such as willingness to bear

uncertainty, tolerance for ambiguity or the need for achievement.

However, researchers that fall into the second group have sought to explain entrepreneurship by reference to the environment in which the entrepreneurs have been found. Generally, this approach has sought to identify situations in which entrepreneurial activity, often measured as new firm formation, is more likely to occur. The views of the group are on issues such as education and economic and political regulation to give effect to the enterprise. It can be seen where the role of institutions like government and of business policy is said to facilitate or help to increase entrepreneurial activity. However, that view is not shared by Shane and Khurana (2000), as both of them suggested that various approaches by researchers in this field failed to provide an adequate explanation for entrepreneurship, largely because they did not consider human agency. Shane (2003) claims that entrepreneurship is a self-directed activity that does not occur spontaneously from the presence of technological or industrial change. Rather, it requires the action of individuals who identify and pursue opportunities, and he reiterated that no amount of investigation of the environment alone could provide a complete explanation for the entrepreneurship phenomenon. Thus, the result of the discussion and debate on issues relating to business and the environment has paved the way for the recent study on the effects of business environmental factors in the area of entrepreneurial opportunity. Shane & Venkataraman (2000) sought to shift the field's focus away from an equilibrium perspective that overweights the characteristics of individuals in explaining entrepreneurship. In contrast to the prevailing sentiment at that time, he argues that entrepreneurship should be seen as a process and not as the embodiment of a type of person. Over the past decade the field has largely adopted this process perspective (Shane, 2012). Additionally, Shane argues that we now have a much better understanding of the process through which people exploit opportunities by creating new organizations than we had a decade ago. However, much less progress has been made. (p.14). Shane's (2012) view is made clear in the below statement.

We have a little more understanding of the process by which people exploit opportunities within existing organizations than we had a decade ago. We also have advanced very little in our knowledge of how entrepreneurs identify opportunities, formulate business ideas, and evaluate them. While research has begun to examine the effect of the value of entrepreneurial opportunities on their exploitation, we still have a limited understanding of how the business ideas formulated by entrepreneurs affect their decisions to exploit opportunities, as well as what influence the difficulty and risk inherent in the pursuit of opportunities have on the exploitation decision. Our understanding of how context influences the identification and exploitation of opportunities continues to be sparse, with very little learned about the impact of institutions and firm characteristics on these processes. Last, we do not explain much about the process of identifying and exploiting high-potential opportunities, given their rarity and the emphasis of researchers in collecting representative data over the past

decade. Clearly, more research needs to be conducted on the entrepreneurial process. (p.14)

Several authors suggest that the study of process, although not prominently employed by researchers in the field, is at the epicenter of the debate on the nature of entrepreneurship (Moroz & Hindle, 2012). A process-focused approach offers much unexplored potential for understanding, if not unifying, a highly disparate research domain (Bygrave, 2006; Low & MacMillan, 1988; Ucbasaran, Westhead, & Wright, 2001; Zahra, 2007). Whitehead (1929) posits that there are both merit and opportunity for balancing pure theory development with practice-based theorizing and adopt an epistemological approach that employs a process-based worldview to examine the phenomenon of entrepreneurship. Events are framed in terms like flow, creation, and “becoming” (Aldrich & Martinez, 2001; Steyaert, 2007; Van de Ven & Poole, 1989). This perspective is argued to acquit well with the study of entrepreneurship, which is fundamentally an *action-based* phenomenon that involves a highly interrelated set of creative, strategic, and organizing processes (Moroz & Hindle, 2012). To understand the “how” of a particular outcome, researchers of process must focus a great deal of their critical attention on: 1. How change is created (the transformation of inputs to outputs) and 2. The ontology of “becoming” that is associated with progressive individual and social change that takes place as a result of the transformational process. (p.787). To guide the thesis, I initially and tentatively adopt William Bygrave’s definition of the entrepreneurial process as involving “all the functions, activities, and actions associated with perceiving opportunities and creating organizations to pursue them” (Bygrave, 2004, p. 7). In analyzing the cases of biotech entrepreneurs in Malaysia, I concur with Shane’s (2012) that the entrepreneurial process does not always take place in an ordered or strategic way. Hence, there may be no optimal entrepreneurial process, allowing for many equally effective approaches, which is an important issue for the field to explore (p. 14).

2.2 Entrepreneurial Opportunity - The Individual Forces

As acknowledged in several studies (Baron 2006; Shane 2000; Shane and Venkataraman 2000), opportunities have a critical role in the entrepreneurial process. Hence, the main point of interest in research on opportunity recognition has been why certain individuals discover opportunities that others do not (Kirzner 1979; Shane 2000; Shane and Venkataraman 2000; Venkataraman 1997). Prior knowledge in association with high-level cognitive capabilities is important in identifying and pursuing an opportunity (Baron 2006; Shane 2000; Shane and Venkataraman 2000). The individual cognitive process in the identification of opportunities is shaped through the previous life career/experiences of individuals. Venkataraman (1997) referred to this as a “knowledge corridor,” which allows the individual to recognize certain

opportunities but not others. Sarasvathy et al (1998) view that different individuals discovered different opportunities, according to their particular way of gathering and processing information. Three major dimensions of prior knowledge, namely knowledge of markets, knowledge of ways to serve the markets, and knowledge of customer problems, have been regarded as important for entrepreneurial discovery (Shane 2000). In addition, current jobs, work experience (Aldrich 1999), and technological knowledge (Park 2005) are considered to be the general sources in facilitating opportunity discovery. Scholars have explored how individuals build on prior knowledge to discover and exploit entrepreneurial opportunities (Eisenhardt & Schoonhoven, 1990; Shane, 2000). Knowledge is an important ingredient that enhances the ability to take action to recognize opportunity. Harper (1996) notes that market research can aid entrepreneurs in identifying the most promising ideas and tailoring their offerings to fit more closely with the actual entrepreneurial opportunity. The Malaysian car manufacturer, Proton, for example, seized a very profitable opportunity when it began mass-producing automobiles at a much lower cost than other available alternatives, but it missed the chance to maintain its lead by not seeing the market for new models and more options for their cars. The ability of Proton to sense, understand and analyze the need for new models or other options to serve their existing market share may stimulate new business opportunities.

Knowledge sharing and exchange provides an environment for entrepreneurs to engage in entrepreneurial activity. Harper (1996) explains that it is possible for people to invest in activities that create a more fertile environment for observing entrepreneurial opportunities. Although Proton may be seeking information, investing in human capital, and systematically searching through promising ideas, these are not entrepreneurial acts in themselves, but they can create an environment where entrepreneurial insights are more likely to be generated. Research and development activities may be approached in a different way that involves entrepreneurial insights. In contrast, Holcombe (2003) claims that research and development activity is not entrepreneurship, but by investing in research and development businesses can create an environment conducive to entrepreneurial discovery. This is further explained in his statement:

'Because entrepreneurs discover previously unexploited profit opportunities, entrepreneurship is more likely within an institutional framework that makes profit opportunities easy to spot. The first prerequisite is the opportunity to make a profit. If high taxes or excessive regulation makes profits unlikely, there is little incentive to act on entrepreneurial opportunities. Furthermore, if the price level is erratic and unstable, prices will not convey as much information, making it more difficult for entrepreneurs to differentiate genuine profit opportunities from price discrepancies caused by inflation. Thus, a free market institutional structure is an important

prerequisite to entrepreneurial activity. An understanding of the origins of entrepreneurial opportunities is important in its own right, as a guideline for creating economic policies that will lead to prosperity. From an academic standpoint, an inquiry into the origins of entrepreneurial opportunities helps to develop Kirzner's theory of entrepreneurship. Kirzner focused on the actions entrepreneurs take in response to entrepreneurial opportunities. By showing that those entrepreneurial actions they are the primary cause of new entrepreneurial opportunities, Kirzner's theory of entrepreneurship become complete.' (Holcombe, 2003, p. 41)

Knowledge also provides information. The information needed to seize some entrepreneurial opportunities comes from sources available in principle to everyone, although recognizing that the information that a person acquires constitutes an entrepreneurial opportunity may also require some specific knowledge of time and place. This is evidenced in the case of AirAsia, a Malaysian low-cost air carrier. Although the information about the huge market demand for people to travel on budget airlines was available to everyone, it was the entrepreneur and CEO of AirAsia who first seized the opportunity of offering short-haul and long-haul travel services to people by establishing AirAsia. The CEO possessed some specific knowledge about the opportunity offered within the airline industry, within that time and place, without waiting a long time to exploit the opportunity. Here, there is a direct relationship between entrepreneurship and knowledge (Holcombe, 2003). For example, Choi and Shepherd (2004) investigated entrepreneurs whose businesses were located in incubators. They found that entrepreneurs were more likely to exploit opportunities when they perceived more knowledge of customer demand for the new product, more fully developed necessary technologies, greater management capability, and greater stakeholder support.

In their study of biotech firms, Nonaka and Takeuchi (1995) claim that opportunities lie not only in knowledge creation but also in knowledge conversion (Zahra et al., 2007) and exploitation (Kodama, 1995). While, Zahra (2008) suggested that knowledge creation does not automatically lead to effective knowledge exploitation because profit and newly developed knowledge have to be converted into ideas that are refined and improved. On the other hand, conversion means changing knowledge from one form to another and thus it translates scientific and technological discoveries into information that is accessible to other technology and business audiences, who can appreciate relevant opportunities and their potential (Zahra, 2008). According to Holcombe (2003), there are two categories of opportunity, where the first is open to the innovator and the second is open to anyone. The first category is only open to innovators due to the inability of others to observe the innovation. The second category, on the other hand, is open to anyone because it relies only on seeing an unexploited market using generally available information. As people see the

market as a medium that presents entrepreneurial opportunity, other opportunities also emerge. These entrepreneurial opportunities could be as simple as purchasing something cheap in one location and selling it to gain profit somewhere else, or as complex as buying inputs, combining them to create new products or services, and selling them for a profit. Holcombe (2003) does not see innovation and technological advance as entrepreneurship. The case of IBM is used as an example. In the 1960s, IBM developed the multi-touch screen technology. Unfortunately, due to a lack of entrepreneurial insight, IBM as the creator failed to capitalize on the entrepreneurial opportunity of the technology that only they had then. Instead, IBM just revealed the ideas and, as a result, sensing and recognizing this opportunity, Apple acquired the technology – Fingerworks – and developed various multi-touch technologies between 2001 and 2005, including touch screen keyboards and the iGesture Pad and its multi-touch technology. In other words, when innovators fail to see and grasp entrepreneurial opportunities, they open doors to other entrepreneurs to capitalize on their ideas.

Many scholarly studies view entrepreneurship as embedded in a complex network of social relationships. Researchers have generally obtained positive evidence that networking, whatever its form, does have an impact on a business venture's survival and success (Aldrich, 1989; Baron & Shane, 2005; Carter et al., 2003). Further, network theorists view entrepreneurship as integrated in a complex network of social relationships. Within these networks, entrepreneurship is facilitated or constrained by links between aspiring entrepreneurs, resources and opportunities (Aldrich & Zimmer, 1986). Through access to and membership of a social network, entrepreneurs are able to establish support systems and successful startups and entrepreneurial ventures. Researchers of networking and entrepreneurship (Baron & Shane 2005; Baum et al., 2000; Carter et al., 2003) have developed several typologies of networks, namely instrumental networks, personal networks, and symbolic networks. Instrumental networks (formal) generally explain instrumental relations, for example, formal delivery contacts and public promotions. Instrumental ties emerge during job performance and they entail the exchange of resources such as knowledge, skills and material resources. Interestingly, past studies indicate that entrepreneurs from developed countries tend to rely more on these formal instrumental networks (Hofstede, 1980), for example, business assistance and facilities from government and private agencies. This may suggest to entrepreneurs to seek help and to build other forms of personal or formal networks. Additionally, Carter et al. (2003) agree with the positive influence of personal networks such as informal networks, endorsing family, spouse, parents and children as a major source of support. This support is viewed as helpful to

entrepreneurs as a source of business encouragement, social and professional advice and labor, and financial and material resource acquisition for entrepreneurial activities.

Johannisson (1998) confirmed in his study that the personal network of the entrepreneur is the most important resource of the firm. Meanwhile, Aldrich (1989) claims that the significance of personal contacts as an aid to business development has also been validated in a study showing that strong ties in social networks facilitate the start-up process. It has been suggested that an entrepreneur's contact with other persons (Crick and Spence 2005; Ellis 2008; Ozgen and Baron 2007; Singh 2000) are important in opportunity discovery: the extent of an entrepreneur social network is positively related to opportunity discovery. Social ties serve as conduits for the spread of information concerning new opportunities (Burt 2004; Granovetter 1973), and the ability to recognize novel opportunities may be determined by the reach and abundance of one's ties with others (Kontinen & Ojala, 2011). Ozgen and Baron (2007) discovered that the greater the extent of social ties with mentors and informal industrialized networks, the more positive were the effects on opportunity recognition. However, social relationships with family members and close friends did not increase the ability to recognize new opportunities (Kontinen & Ojala 2011). In addition to social ties, which commonly refer to non-formal relationships, entrepreneurs may have formal ties with other business partners or institutions (Coviello 2006; Johanson and Mattsson 1992; Ojala 2009); these, too, serve as an important source of knowledge related to new opportunities.

In addition to what have been described, professional forums (Ozgen and Baron 2007) and trade exhibitions (Ellis 2008; McAuley 1999; Meyer and Skak 2002; Reid 1984) have been found to be sources for information and social ties, creating the potential for entrepreneurial opportunity recognition. However, the role of exhibitions as a source of social ties is complex. According to Ellis (2000), in the context of exhibitions, the communication of opportunities cannot be uniquely attributed to a buyer, a seller, or a third party (such as a government agency). Ellis (2000) suggests that it is appropriate to treat exhibitions as a special kind of initiation scenario. The particular nature of exhibitions is highlighted in the studies of Reid (1984) and McAuley (1999), who found that participation in international exhibitions generated more information about international opportunities than any other information source. Trade exhibitions and similar forums where people share common interests are a context with a dense network: the proportion of potential network ties is high (Coviello 2006). It has been recognized that network ties, activeness and alertness, and prior knowledge are related to how entrepreneurs recognize new opportunities (Kontinen & Ojala, 2011). Opportunity discovery can be assessed from several contexts. In this thesis, which takes its starting point from earlier studies (Baron 2006; Ellis 2008; Ozgen and Baron 2007;

Shane 2000; Singh 2000), the phenomenon is studied from the perspective of (1) the importance of network ties, (2) activeness and the alertness in searching for opportunities, and (3) prior knowledge.

2.3 Opportunity Exploitation - Sociocultural Forces

Holcombe (2003) suggests that three major categories of factors create profit opportunities: (1) factors that disequilibrate the market; (2) factors that enhance production possibilities; and (3) entrepreneurial activity that creates additional entrepreneurial possibilities. A number of factors could disequilibrate the market according to Holcombe, and they include a change of preferences, requiring resources to be reallocated to conform to the new pattern of preferences and depletion of natural resources. They generally require new ways and different methods of addressing the universal problems. Many factors can push an economy away from equilibrium, producing entrepreneurial opportunities. Oil depletion, for example, has led to many studies being done to identify potential sources of alternative energy supply. This led to the identification of other means of addressing global energy concerns that later stimulated opportunities for global car manufacturers such as Toyota and Honda to design and produce a hybrid car (a car that uses electricity as the source of power and so uses less petrol) and to serve the needs and wants of the markets.

Building on the earlier work of Schumpeter (1946) on sources of opportunities and on Holcombe's notion on the factors affecting market equilibrium, the researcher outline some empirical evidence that demonstrates the relationship between sources of opportunities and the existence of those opportunities. In his work, Bhide (2000) explained that about one half of the founders of the Incorporated 500 companies (the 500 fastest growing private companies in the United States), indicates that they initiated their businesses in response to a specific change in technology, regulatory regime, fashion or other external factors. Technological changes in the environment determine the pace of research and development, and progress made in introducing modern technology in production. In a fierce business environment, technology is the key to development. Blau and David (1987), for example, examined the self-employment rate in the United States over a two-decade period and found that an increase in the rate of technological change led to an increase in the self-employment rate. In a similar context, Shane (1996) looked at the number of organizations per capita from 1899 to 1988 and found that the rate of technological change, measured as the annual number of new patents issued, had a positive effect on the number of organizations per capita in the new economy in the subsequent year.

Additionally, Breznitz et al. (2008), investigate the commercialization strategies of universities in the US. The study reviews the issue of the university as social agent by way of technology transfer. The study also observes the role of entrepreneurial cultures (bottom-up) in the technology transfer process. They claim that the MIT culture rewards those who are 'academic entrepreneurs' and hence creating an open environment. This kind of environment, where research activities are undertaken among external institutions or new ventures, is considered positive. Eventually, this helps to enhance the students' learning process and thus leads to newly created activities that may generate profit opportunities. Klevorick et al. (1995) surveyed research and development managers in over 100 lines of business to evaluate the effect of technological change on the creation of entrepreneurial opportunities and concluded that technological change is a greater source of opportunity in some industries than in others, indicating that industries with closer ties to science have more entrepreneurial opportunities. This is in line with the study conducted by Shane (2001a) on 1,397 inventions patented by the Massachusetts Institute of Technology (MIT) between 1980 and 1996; Shane concluded that more heavily cited patents were more likely to lead to firm formation than less heavily cited patents. All of these findings suggest that regardless of its forms (for example – patent) technology does have positive effects on entrepreneurial activity.

A number of studies have been conducted in an attempt to establish a typology of entrepreneurial opportunity. For example, Companies and McMullen (2007) developed a typology of opportunity based on a review and synthesis of strategic management and entrepreneurship literatures and they concluded that opportunities were built on the disciplines of the sources and types of opportunity. In addition, opportunities are objective in the sense that they are social network structures and yet are also subjective in nature because their exploitation depends on the entrepreneurs' political skills and ability to persuade others. Companies and McMullen (2007) further explain that changes in the political environment (political stability) and policies of the government could spark an entrepreneurial action that may lead to entrepreneurial opportunity. These different sources and types of opportunities described by the Company and McMullen (2007) are presented in Table 2.1.

Table 2.1: Sources and Types of Entrepreneurial Opportunities

	Economic	Cultural Cognitive	Sociopolitical
Source Subtypes	Resource and capabilities: information Technological Market	Templates; knowledge Producer Consumer	Network structures Governance structure Network Political Network Knowledge
Example	Technological Product Innovation (Ahuja et al., 2004) Factor innovation (Afuah, 2000) Market latent needs (Noda et al., 2000)	Producer Cultural communities (Stewart, 1990) Robust designs (Hargadon et al., 2001) Consumer Fads (Strang et al., 2001, Orlikowski, 2000)	heterogeneity (Powell et al., 1996) Structural holes (Roda et al., 2004) Political Elite cleavages (Padgnet et al., 1993) Deregulation (Kogut et al., 2002)

Source: Companies and McMullen (2007)

Companies and McMullen (2007) claim that the economic 'school' as objective dimensions of knowledge and information, attributing the existence of entrepreneurial opportunities for the distribution (or lack thereof) of information regarding material opportunities in society. Shane (2003) agrees with this notion in a different way, by identifying educational institutions as a means to entrepreneurial opportunity. He believes that educational infrastructure is a source of entrepreneurial opportunity because educational institutions conduct scientific research that results in the creation of new knowledge that is the basis of many entrepreneurial opportunities. Inform plays a central role in opportunity recognition (Ozgen and Baron 2007; Shane 2000; Shane and Venkataraman 2000). Information involving patterns of changing conditions (i.e. Changes in technological, economic, political, social, or demographic circumstances) - can be regarded as a source of opportunity recognition (Baron 2006). Hence, educational institutions are a source of opportunity because they are important mechanisms for diffusing information, thereby facilitating the transmission of information that generates opportunities (Aldrich & Wiedenmeyer, 1993). For example, human capital such as scientists and researchers in universities or research institutions supports the creation of entrepreneurial opportunity. In their study, Zucker et al. (1998) examined the rate of firm formation of biotechnology firms across 183 regions in the US from 1976 to 1989. They suggested that both star scientists and top-quality universities increased the stock and annual flow of biotechnology firms in the region. Eventually, there was a positive relationship between the availability of human capital and quality universities and firm creations. Shane (2003) suggests that universities generate new knowledge from their

high technology research and disseminate that knowledge to the people in the community.

Leading on from this discussion, the issue is, how will new firms react to their relationship with the university? Mueller (2007), in her empirical study “Exploiting Entrepreneurial Opportunities: The Impact of Entrepreneurship on Growth”, finds that although the stock of knowledge in a region is an important determinant of local economic growth, it is new firms in general – seen as the exploitation of the opportunities that arise from R&D activities – and not public institutions that are the means by which knowledge contributes to the local economy. Distinctively, her results suggest that the contribution of public institutions and universities to regional growth pales in comparison with the contribution made by high-tech startups in particular. Mueller interprets the findings to suggest that new firms champion the innovations that drive economic growth and, as such, are far more likely to challenge the market positions of incumbent firms. Holcombe (2003) argues that when production possibilities increase, entrepreneurial opportunities are created in several ways (for example more inputs), including increases in the quality of physical and human capital, allowing inputs to be combined in new ways. This leads to income growth and this opens up the possibility of marketing new goods, or expanding the market for goods that are income-elastic.

Hence, enhancements in production possibilities may be the result of a combination of higher market demands and new technology application. Without them noticing it, this signals to manufacturers to use advanced and high-level technology in the production processes, with fewer personnel. While, this may suggest disequilibrium in the market as many people lose the opportunity to earn incomes and it reduces the ability to spend. For example, the use of robotic precision technology of car manufacturers and in the food/beverage sector decreases the opportunities for people to work in these industries as firms depend less on human labor. Another source of opportunities according to Holcombe (2003) comes from entrepreneurial activity. The factor or activity that creates an entrepreneurial opportunity is explained below:

‘The most important factor creating entrepreneurial opportunities, however, is the act of entrepreneurship itself. When an entrepreneur seizes on a new entrepreneurial opportunity, new market possibilities are created. If an entrepreneur creates a new product, that creates the possibility of complementary products and increases the demand for inputs into the new product (but also may reduce the demand for other goods). If an entrepreneur discovers a better process for producing an existing product, this also creates opportunities for potential input suppliers. Thus, there is not a stock of entrepreneurial opportunities that can be used up as entrepreneurs take them; rather, when entrepreneurs act on one opportunity they create additional entrepreneurial opportunities, so the more entrepreneurship there is in an economy,

the more entrepreneurial opportunities will be available for others.’ (Holcombe, 2003, p. 41)

Holcombe argues that when an entrepreneur takes advantage of a previously unnoticed profit opportunity, new profit opportunities are then created, allowing other entrepreneurs to act, and the process continues to spread through the economy, generating additional profit opportunities. Olson (1996), in a paper titled “Big Bills Left on the Sidewalk”, argues that people just do not pass by easily exploited profit opportunities. Olson explains why some economies grow more rapidly than others, and makes an important point that when the incentives are right, profit opportunities do not remain unexploited for long. Holcombe commented that if Olson is right, the continuing entrepreneurial activity requires a continuing source of new entrepreneurial opportunities, and the key point of this section is that entrepreneurs create those new opportunities as they exploit existing opportunities. To comprehend how entrepreneurship can create additional entrepreneurial opportunities, consider an example of one of the most entrepreneurial ideas at the end of the twenty-first century: the online auction platform. Someone had the idea that rather than having a physical auction in one dedicated place, operating the auction online using a real-time website meant that bidders from all over the world could view and bid for the products or services in real time. Holcombe (2003) suggests that the opportunity had not existed very long before it was exploited. In reflection of this notion, as an example, the opportunity had not been long unexploited; rather, shortly after the internet technology had become a popular means for business transactions, this opportunity was observed and acted on. The opportunity was created by the development of the internet technology, which is itself an earlier act of entrepreneurship, and internet users know that online catalogues, online retailers and internet payment gateways are other opportunities created by entrepreneurs. Hence, this particular pool of entrepreneurial opportunities only existed after the development of the internet technology and physical auction activities. The entrepreneurial activity of the creator of the online auction website did not use up an entrepreneurial opportunity; it created many more entrepreneurial opportunities. Entrepreneurship researchers try to make sense of how other element such as institutional forces influence the actions on how entrepreneurs exploit entrepreneurial opportunities.

2.4 Opportunity Exploitation - The Institutional Forces

Shane (2003) posits that due to the non-observability of the construct of entrepreneurial opportunity, researchers have had to examine proxy measures in the effects of political changes. However, changes such as political changes may stimulate entrepreneurial activity

in the form of new firm creation. As an example, the changes of political leadership in Malaysia, from the former Prime Minister, Tun Dr. Mahathir Mohammad to Tun Abdullah Haji Ahmad Badawi, have instigated changes in the country's future ambition. Tun Dr. Mahathir Mohammed focused on policies to enhance the information and communication technology (ICT) sector through the creation of the multibillion dollar project of the Multimedia Super Corridor (MSC), while his successor focused on enhancing the agricultural sector by emphasizing biotechnology as an engine of economic growth. During the leadership period of Prime Minister Tun Abdullah Haji Ahmad Badawi, the National Biotechnology Policy (NBP) and the MBC were formed. This initiative affects the biotechnology industry in Malaysia in a positive way thus supporting Buenstorf's (2007) statement on the role and development of an industry (read biotechnology) on entrepreneurial opportunities:

'Empirical evidence indicates that basic industry characteristics shape the extent and kind of entrepreneurial opportunities as well how these change over time. The development of an industry naturally leads to the creation of new opportunities; it also tends to cause new potential entrepreneurs capable of pursuing these opportunities.'
(Buenstorf, 2007)

Shane (2003) suggests that just because political change is a source of entrepreneurial opportunity it does not mean that new firms founded at times of political change will perform better than those founded at another time. He also argued that the existence of entrepreneurial opportunity might be enhanced by political change, but the skills and abilities of entrepreneurs exploit it might be hindered. As a result, Shane (2003) suggested that political change might be a source of opportunity, but not a source of good entrepreneurial performance. In the context of this thesis is less interested in the investigation of entrepreneurial performance. Hence, the literatures demonstrate that political change decreases the survival rate of new ventures. A study done by McMillan and Woodruff (2002) examined the relationship between reform in a communist system and the growth in entrepreneurial activity. Their view that the distortions wrought by communism generated market opportunities which entrepreneurs filled. It was observed that in China, Russia and Poland, the profitability of these opportunities declined over a six-year period as entrepreneurs ventured their respective markets to exploit these opportunities. The study of McMillan and Woodruff (2002) suggests that the greater the distortions, the higher the average rate of profits and the slower the rate of entrepreneurial entry, the more slowly the average rate of profit declined. There are also other factors that influence entrepreneurial opportunities. Factors such as regulatory changes may also affect the rate of new firm formation. While, changes such as deregulation in the institutions set-up might influence the rate of firm formation. For example the studies by Kelly and Amburgey (1991) found that the rate of airline formation in the United States increased after the deregulation of the airline

industry. Meanwhile, another set of studies indicates that increased regulation reduces the rate of firm formation. Stuart and Sorenson (2003a), for instance, examined the founding of new biotechnology firms and found that initial public offerings and acquisitions of biotechnology firms located in the same metropolitan statistical area increased firm founding rates, but this only happened if states did not enforce post-employment non-competing covenants. However, Shane (2003) view that increased government regulation does not always discourage firm formation, suggesting that the source of entrepreneurial opportunity is regulatory change, not deregulation.

Sometimes government regulation is a source of opportunity because it provides resources that increase demand or provide subsidies (Baum, 1996). These resources create opportunities to serve customers that could not be served without the government support. Government assistance in the form of financial supports and research grants affects the entrepreneurial activities. Many examples support this notion, and a study by Tucker et al. (1990) found that increases in government funding of social programs in Toronto, Canada, between 1970 and 1982 led to an increase in the rate of firm formation of voluntary service organizations. Feldman (2001) found that the rise of entrepreneurship in the Washington, D.C. (US) area resulted, in part, from federal government procurement policies to facilitate the demand for information technology and biotechnology. The study of Busenitz et al (2000) developed and empirically validated a survey instrument for measuring the institutional profile of entrepreneurship across six countries. The findings suggested that the regulatory dimension of the institutional profile consists of laws, regulations, and government policies that provide support for new businesses, reduce the risks for individuals starting a new company, and facilitate entrepreneurs' efforts to acquire resources. Busenitz et al. (2000) argue that the study makes several important contributions; the measures of institutional profiles managed to address issues related to entrepreneurship and validated three distinct dimensions, namely regulations, norms, and cultural-norms, against external constructs.

Additionally, in 2008, a study on institutional environments for entrepreneurship in emerging economies was initiated. For example, the study by Kostova et al. (2008) set out to validate the Busenitz et al.'s (2000) instrument to measure a country's institutional profile in the context of three emerging economies in Eastern Europe, namely Bulgaria, Hungary, and Latvia. Busenitz and colleagues claimed that the scale is an appropriate instrument to use in the context of emerging economies. In contrast, Kostova et al. (2008) explain that cross-national differences persist in the institutional profiles of emerging economies and the results of Kostova et al.'s study suggested that the overall institutional environment as well as the three underlying dimensions were not favorable for entrepreneurship in any of the three

countries. However, it was argued that the study only provides a snapshot in time, whereas institutional profiles of countries can change over time (Peng, 2001). Later there were a few studies that explain the concept of entrepreneurial development, and one of them is by Fogel. Fogel (2001) claims that the entrepreneurial development of Hungary has been hindered by lack of preferential treatment, high taxation and the unavailability of low-cost, long-term financing. To improve the entrepreneurial process, he recommended that: (1) small businesses be given opportunities for low-cost borrowing and venture capital funds; (2) technical support and access to technology should be made a priority for small business development; (3) more entrepreneurial and business training programmes should be made available; (4) the government should offer tax incentives and other special programmes for small businesses and should reduce reporting requirements; and (5) financial and regulatory institutions in the country should create a more enterprise-friendly culture that supports entrepreneurs, not only financially but also through networks, training, and business information systems. The argument explains that institutional support facilitates entrepreneurship activities. While, Dana (1990) claims that countries that keep rules and regulations to a minimum, offer tax and other incentives, and provide training and counselling services to start-up entrepreneurs increase the likelihood of new venture development.

In the works of Baumol (1993, 2005) and North (1990, 2005a), they both highlighted the relationship between the institutional environments affecting entrepreneurship activities. Incentives deliberately enhance the process of stimulating business activities. They can also be in the form of tax exemptions and financial support or grants from financial institutions. Nevertheless, positive business environments correspond to entrepreneurial development and this supports the study of Aidis et al. (2008a) on institution and entrepreneurship in Russia. The study investigates the influence of a combination of weak institutions and corresponding network structures on entrepreneurial development and the results depict that a negative environment for business, and especially entrepreneurial activity, in Russia, has led to low levels of entrepreneurship. The study also found evidence that a significant network effect, for example, the strong ties between businesses and state administration in the Russian economy, seem to provide greater opportunities for existing entrepreneurial insiders to develop new ventures than for newcomers taking the plunge of establishing startups. Bruton and Ahlstrom (2003), in their study of the Asian economy, argue that the institutional environment affects venture capital. For example, the institutional environment in China yields several significant differences in the actions of venture capitalists compared with those in the West. This happens in the form of government influence on venture capital and policies. Furthermore, the study signifies that both policies and government

interventions in China as well as the West serve different purposes. For example, the policies and support of institutions in the West may be viewed by businesses as more helpful than the ones available in China. Though this argument is debatable, one may agree that there is still little effort being made to address this issue from the perspective of new emerging economies such as Malaysia. In another study, George et al (2002) explores institutional forces such as the contribution and the relationship of the university to the biotechnology industry in the US. This study investigates the collaborative relationship between US universities and the industry. The study suggests that universities have played a key role in giving birth to the biotechnology industry and supporting the creation of new companies to exploit its discoveries (Kuhlman, 1996). This suggests that the university relationship facilitates the process of new venture creation, and this clearly explains the meaning of entrepreneurship within the context of new venture creation. Furthermore, the data from the National Science Foundation (US) report (NSF, 1998) concludes that there is an increasing trend in cooperation between universities and industry in basic research.

Further to this discussion, George et al. (2002) claim that there are benefits of interaction between the university and the industry in basic research. For example, between 1990 and 1997, MIT faculty and graduates have founded more than 60 companies that have a combined market value of US\$2.5 billion and created more than 2,000 high technology jobs. MIT, which receives about 100 patents a year, is illustrative of a positive trend in university–business relationships (Thayer, 1997). However, the argument of this study was the exclusion of privately held firms and those firms that belong to a university incubator or the research park system. By excluding these firms, the study has narrowed the scope of the important payoffs of university links whereby many high technology spin-offs live in these parks but remain privately held. The above reviews primarily focused on developers and selected developing countries. Addressing the entrepreneurial opportunities context in an emerging country such as Malaysia could positively address Shane’s (2012) concern on the limited understanding on how entrepreneurs identify opportunities, formulate business ideas, and evaluate them. Building on the earlier literatures, the next sub chapters explain different perspectives on entrepreneurial opportunities that influence the analysis and framework in this thesis.

2.5 Scholarly Debates on Entrepreneurial Opportunities

2.5.1 The Discovery Views

Casson (1982), Shane and Venkataraman (2000: 220) and others (Eckhardt and Shane, 2003: 336) define entrepreneurial opportunities as: “situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends or ends–means relationships. Explaining the formation of opportunities is vital to entrepreneurship research (Alvarez & Barney, 2007; Baron, 2008; Venkataraman, 1997). Yet, there is ambiguity about the ontological status of opportunities in entrepreneurship theory and debate about their role in the entrepreneurial process (Alvarez & Barney, 2008; Ardichvili, Cardozo, & Ray, 2003; Corbett, 2007; Davidsson, 2003; de Koning, 2003; Eckhardt & Shane, 2003; Ireland, Reutzell, & Webb, 2005; Klein, 2008; McMullan & Shepherd, 2006). Despite an assumption among most studies that “to have entrepreneurship, you must first have opportunities” (Shane & Venkataraman, 2000), there is no distinct conceptual foundation—a substructure beneath the theories—that effectively embeds this unique assumption into the diverse body of research that constitutes the entrepreneurship area (Murphy, 2011).

Acs & Audretsch (2003) suggest that in any debate or discussion of entrepreneurial opportunity to be productive, it must discuss issues such as whether opportunities are discovered or created by entrepreneurs. In doing so, the analysis looks at the overview of entrepreneurial activity. In this context, it is useful to evaluate the basic premise of teleological theories of entrepreneurial action that explain human behavior by looking at the impact of that behavior on the ability of individuals to accomplish their purposes (Alvarez & Barney, 2007). The discovery and creation views seek to explain the same issues – actions that entrepreneurs take to form and exploit opportunities (Shane, 2003; Shane & Venkataraman, 2000). Both of these views have much in common. However, they generate different predictions about the specific contexts on the drivers of entrepreneurs to effectively execute opportunities. Further, between these two, discovery theory has received much attention in the literature (Gaglio and Katz, 2001; Shane, 2003; Venkataraman, 2003).

The discovery view has its roots in Austrian economics (Kirzner, 1997). In this view, competitive imperfections are assumed to arise exogenously from changes in technology, consumer preferences, or some other attributes of the context within which an industry or market exists (Kirzner, 1973). Shane (2003), in his review of the literature, cites technological changes, political and regulatory changes, and social and demographic

changes as examples of the kinds of events that can disrupt the competitive equilibrium that exists in a market or industry, thereby forming opportunities. Here he indicates that exogenous shocks form opportunities and these have strong implications for the discovery view. For example, this emphasis suggests that discovery theory is based on realistic assumptions in the philosophy of science – that opportunities, like mountains, exist as real and objective phenomena, independent of the actions or perceptions of entrepreneurs, just waiting to be discovered and exploited (McKelvey, 1999).

Consequently, there has been considerable interest in why, when, and how some people evaluate opportunities positively, while others cannot or do not (Chiles, Bluedorn, & Gupta, 2007). While many scholars have agreed with Venkataraman and Shane's (2000) effort to introduce opportunities into the discussion of entrepreneurship, their description of entrepreneurial opportunities has led to much debate in the entrepreneurship literature. The first debate was on the issue of whether opportunities are always profitable. This is an important point, because if people who identify opportunities are entrepreneurs and everyone who identifies an opportunity is successful, then entrepreneurial failure would not exist (Shane, 2012). Singh (2001: 10) claimed that Venkataraman and Shane's (2000) definition "requires that entrepreneurial opportunities generate a profit," challenging its validity. Shane (2012) posit that Singh is right to point out that entrepreneurial opportunities cannot always be profitable, but Venkataraman & Shane believe that Singh misunderstood the meaning of the word "can" in their definition. They used that word to indicate possibility, this is further clarified by Shane (2012) in his arguments;

Venkat and I also argued that an entrepreneur's conjecture about what will happen if resources are recombined and the output sold can turn out to be correct or incorrect. If it is correct, then the entrepreneur earns a profit. If it is incorrect, then the entrepreneur incurs a loss. Thus, our definition of entrepreneurial opportunities does not *require* them to be profitable; rather, our definition suggests only that the probability new goods, services, raw materials, and organizing methods could be introduced and sold at greater than their cost of production exceeds zero (p. 15).

Shane (2003) claims that it is the entrepreneurs who bring 'agency to opportunity', in the sense that they exploit them (the opportunities). The view that exogenous shocks form opportunities also suggests that the discovery view is predominantly about search – systematically scanning the environment to discover opportunities to produce new products or services. During this process, entrepreneurs must consider both its direction and duration, and must also guard against confusing local search (where modest opportunities to produce new products or services exist) with more global search (where much more substantial opportunities exist) (Levinthal, 1997). This opens to another criticism for discussion on

entrepreneurial opportunities are objective phenomena. Although some researchers have agreed with Venkataraman and Shane's (2000) argument (e.g., McMullen, Plummer, & Acs, 2007), others have challenged it, saying that entrepreneurial opportunities are subjective and need to be enacted or created to exist (e.g., Alvarez & Barney, 2007; Baker et al., 2005; Klein, 2008). I concur with Shane (2012) that the lack of clarity about what he meant by "entrepreneurial opportunities" has led to an unnecessary debate in the field. In so, many authors, such as Davidsson (2003), have interpreted the term *entrepreneurial opportunities* to be synonymous with the term *business (venture) ideas*. For instance, Samuelsson and Davidsson wrote that "the opportunity or venture idea these individuals are pursuing—has been relatively neglected" (2009: 4). The arguments presented by Shane, he believes that "entrepreneurial opportunities" and "business ideas" are different concepts. He argues in the following statement.

Entrepreneurial opportunities are situations in which it is possible to recombine resources in a way that generates a profit. Business ideas are entrepreneurs' interpretations of how to recombine resources in a way that allows pursuit of that opportunity. Entrepreneurs' business ideas are not objective. They are plans created and enacted in response to the entrepreneurs' beliefs about opportunities. In fact, if I substitute the phrase "business idea" for the word "opportunity," I can quote Alvarez and Barney to describe business ideas: *business ideas* "are social constructions that do not exist independent of entrepreneur's perceptions" (2007: 15). Similarly, I can quote Klein and say that *business ideas* "do not exist objectively, *ex ante*, but are created, *ex nihilo*, as entrepreneurs act based on their subjective beliefs" (Shane, 2012: 15).

The idea that opportunities - situations in which people have the potential to make a profit—are objective is not a semantic point (Shane 2012). It is a necessary concept to preserve the ideas that entrepreneurship can be unsuccessful and that entrepreneurship depends on the nexus of people and opportunities (p. 16). If, as Klein explains, "opportunities for entrepreneurial gain are... inherently subjective - they do not exist until profits are realized" (2008: 180) - then unsuccessful entrepreneurship is a logical impossibility. In this case no one entrepreneur can fail to enact an entrepreneurial profit thus if entrepreneurs always generate a profit, then we may not have failed entrepreneurs. Shane (2012) in his latest article, *Reflections on the 2010 AMR Decade Award: Delivering on the promise of entrepreneurship as a field of research*, contends viewing entrepreneurial opportunities as subjective also clashes with the idea that entrepreneurship involves the nexus of individuals and opportunities. He reiterates that if opportunities are formed in the minds of entrepreneurs, as the subjectivists argue, then the opportunity side of the individual opportunity nexus is a function of the individual. Hence, if both opportunities and individuals are a function of individuals, then Shane posits no nexus exists. The argument in his article demonstrates that, all elements of entrepreneurship are a function of the individual, and the

person centric perspective on entrepreneurship must be correct. Klein recognizes this point, saying, “An alternative way to frame a subjectivist approach to entrepreneurship . . . Is to drop the concept of *opportunity* altogether” (2008: 183). However, much of Shane’s discussion focuses on the role of the individual as an agency that brings opportunity to the central to the discussion making less effort to the role of social-cultural factors shaping the opportunities.

Venkataraman and Shane (2000) claim that the exploitation of entrepreneurial opportunities demands the creation of new means-ends relationships (ways to combine resources) rather than optimization within existing means-ends frameworks. Foss and Klein (2008) have challenged this position, saying that there is no need to limit entrepreneurship to efforts to create new means-ends relationships. As they explain, under uncertainty, all profit opportunities involve non-maximizing decisions. Hence, distinguishing between efforts to create new means-ends frameworks and efforts to optimize within existing means-ends framework offers little benefit to understanding entrepreneurial decision making (Shane, 2012). While Foss and Klein (2008) are right that people can pursue profit both by creating new means-ends relationships and by working within existing means-ends relationships, Shane believes that the former involves entrepreneurship and the latter does not. Shane (2012) further reiterates that entrepreneurship involves more than the Kirznerian process of discovering opportunities for profit. It also involves coming up with a business idea about how to recombine resources to exploit those opportunities, as well as the exploitation process itself. (pp.17-18). The lack of complete explanation of recombination of resources led some scholars to characterize Shane and Venkataraman’s (2000) perspective the “innovation perspective” (Koster, 2006), arguing that they were describing entrepreneurs who exploit “radically new and novel, rather than the incremental or improved” (Seymour, 2006: 139) innovation.

These scholars have rightly explained that limiting the discussion of new means-ends relationships to Schumpeterian resource recombination excludes much entrepreneurial activity (Shane, 2012). For instance, Tony Fernandes of AirAsia (Malaysia’s first budget airline) would not have been exploiting an entrepreneurial opportunity, since the airlines business was a well established economic activity at the time Tony started his venture. However, this thesis views that Tony Fernandes was pursuing an entrepreneurial opportunity - the potential for profit in filling the vacuum of needs in the budget airline in Asia. While Tony’s business idea may not have been Schumpeterian, he recombined resources and skills. His recipe for putting together resources was different from the predecessors in the existing airline companies in Asia. While entrepreneurship can and does involve the creation

of fundamentally new recipes for resource combination, as was the case with the initial biotechnology companies that exploited genetic engineering to pursue opportunities for profit, it can also involve more prosaic recombination (Shane, 2012). In fact, Venkataraman and Shane's (2000) referred to both Schumpeterian and Kirznerian types of opportunities. These opportunities, they claimed, differ in the amount of innovation they demand of entrepreneurs' efforts to recombine resources, with Schumpeterian opportunities generally demanding more innovation than Kirznerian ones. For example, the idea of producing bullet proof vest made of coconut shell requires more innovation than the idea of opening a takeaway restaurant in a new location. However, all efforts to exploit entrepreneurial opportunities involve some innovation, because entrepreneurs' resource combinations cannot be complete and perfect replications of resource combinations used by others. Otherwise, the entrepreneurs would, by definition, *not* be recombining resources (Shane, 2012).

One key notion for the understanding of the processes central to the discovery theory is *alertness*. It is imperative that the discovery view assumes that entrepreneurs who discover opportunities are significantly different from others in their ability to either see opportunities or, once they are seen, to exploit them (Kirzner, 1973; Shane, 2003). The substance of alertness was suggested by Israel Kirzner (1973, 1979, 1997, 1999, 2009) in a series of works on entrepreneurship. He considered alertness 'the entrepreneurial element in the economic behavior' (Kirzner, 1973, p. 15). This conceptualization of alertness has been largely used in the discovery literature (e.g. Shane, 2003; Shane and Venkataraman, 2000). Developing in Kirzner's work, Kaish and Gilad (1991) saw alert individuals as having a "unique preparedness" in consistently scanning the environment ready to discover opportunities. Consequently, Kirzner argued that alertness includes creative and imaginative action and may "impact the type of transactions that will be entered into future market periods" (1999, p. 10). Alertness reflects the entrepreneur's prior knowledge (Kirzner, 1973, 1997; Shane, 2000) and prior knowledge, argued Zahra (2008), heightens the entrepreneur's alertness to potential opportunities. For instance, through combining different types of knowledge (including prior knowledge) entrepreneurs, including biotechnologies, sometimes make technological breakthroughs, including some that could even be accidental.

More recent scholars have continued to advance arguments that alertness involves a proactive stance based on a number of cognitive capacities and processes such as prior knowledge and experiences, pattern recognition, information processing skills, and social interactions (Ardichvili et al., 2003; Baron, 2006; Csikszentmihalyi, 1996; Gaglio and Katz,

2001; Shane, 2003). Central among these efforts is the article by McMullen and Shepherd (2006), which argues that entrepreneurship fundamentally involves action. McMullen and Shepherd (2006), posit alertness is not entrepreneurial unless it involves judgment and a movement toward action. “To act on the possibility that one has identified an opportunity worth pursuing” is the heart of being an entrepreneur (p. 132).

2.5.2 The Creation Views

In contrast to this traditional “discovery” view, recent research has suggested a “creation theory” of entrepreneurship (Alvarez & Barney, 2007; Sarasvathy, 2001). Creation theory is a logical theoretical alternative to discovery theory for explaining the actions that entrepreneurs take to form and exploit opportunities (Aldrich and Kenworthy, 1999; Aldrich and Ruef, 2006; Gartner, 1985; Venkataraman, 2003). However, unlike discovery theory, creation theory has yet to be articulated as a single coherent theory in the literature (Alvarez & Barney, 2007). In creation theory, the opportunities are not assumed to be objective phenomena formed by exogenous shocks to an industry or market (p. 15). Rather, they are created, endogenously, by the actions, reactions, and enactment of entrepreneurs exploring ways to produce new products or services (Baker and Nelson, 2005; Gartner, 1985; Sarasvathy, 2001; Weick, 1979). In the creation view, opportunities are endogenously constructed through entrepreneurs’ actions and reactions, making possible their detachment from existing markets or industries (Alvarez and Barney, 2007). As opposed to considering opportunities as the outcome of objective phenomena that exist before any intervention of the entrepreneur, the creation approach assumes that opportunities are social constructs that do not exist independent of entrepreneurs’ perceptions and actions (Weick, 1979). Hence, opportunities are created (rather than discovering) as part of the entrepreneurial process (Sarasvathy, 2001): actors create something from nothing (Baker and Nelson, 2005). As the opportunity does not exist prior to the entrepreneur’s actions, decision makers cannot anticipate the opportunity’s possible outcomes or the probabilities associated with those outcomes (Alvarez and Barney, 2007): they are in a situation of ‘complete ignorance’ (Ellsberg, 1961; McMullen and Shepherd, 2006). The would-be entrepreneur starts the creative process ‘without any certainties about the existence of a market or a demand curve, let alone a market for *his* or *her* product, or a potential revenue curve’ (Sarasvathy, 2001, p. 249).

Moreover, if creation opportunities do not exist before the actor’s intervention, there is no point in searching for existing information that could lead to an opportunity because the

relevant information is not there yet (Barreto, 2012). According to the creative approach, it is important to note that at the moment when the formation process begins, actors typically do not have any idea whether they are (or not) on a path towards an opportunity (Aldrich and Kenworthy, 1999; Alvarez and Barney, 2007; Shah and Tripsas, 2007). As the process unfolds, a succession of actions, reactions, and perceptions follows (Barreto, 2012). Additionally, opportunity creation is about action, experimentation, creativity, and playfulness (Aldrich and Kenworthy, 1999). Actors iteratively attempt to build ways to combine what they have at hand (Baker and Nelson, 2005), trying possible effects that can be created with a given set of means (Saravathy, 2001), testing conventional limitations (Baker and Nelson, 2005), or refusing the constraints of existing logics (Shah and Tripsas, 2007).

Baron (2004, 2006) views that opportunities are recognized; they are enacted through retrospective sensemaking according to Gartner et al. (2003); socially constructed say Sarason et al. (2005) and constructed and intentionally perceived according to Krueger (2000, 2003). Rather than focusing on the objective characteristics of the entrepreneur and the environment, the creation perspective views opportunities as actively constructed by organizational participants and their mental models (Penrose, 1959; Weick, 1979, 1995). The environment is not something that is taken as given, but instead is “enacted” by entrepreneurs. From this viewpoint, the key task facing entrepreneurs is to interpret the equivocal environment and articulate a clear and compelling vision to organizational stakeholders in order to secure the necessary support and effort to enact the vision (Hill & Levenhagen, 1995). Opportunities are thus seen not as exogenous objective states that can be observed *ex ante* but rather as social constructions formed through the entrepreneurs’ perceptions and effectuated through the interactions between the entrepreneurs and their environments (Aldrich & Kenworthy, 1999; Alvarez & Barney). An opportunity is “an image in the entrepreneur’s mind” (Penrose, p. 42), and this image is what drives entrepreneur’s behavior towards opportunity discovery and creation.

The creation view also attempts to explain entrepreneurs’ actions in forming and exploiting opportunities (Aldrich & Ruef, 2006; Gartner, 1993; Venkataraman 2003). This view suggests that opportunities do not necessarily evolve out of pre-existing industries or markets (Etzioni, 1963). Additionally, the term ‘search’ has little or no meaning in creation theory (Alvarez & Barney, 2007). In fact, the creation view suggests that entrepreneurs do not search; they act and they observe how consumers and markets respond to their actions. Creation involves a great deal more than simply recognizing opportunities that already exist; it requires sensing, developing, evaluating, and reframing opportunities (O’Connor & Rice, 2000). Therefore, instead of being passive with respect to the formation of new

opportunities, the creation view assumes that entrepreneurs' actions are the essential source of these opportunities – they build the mountain (Alvarez & Barney, 2007). This view is in line with Baker and Nelson (2005), Bhidé (1999) and Sarasvathy (2001), who argue that entrepreneurs do not wait for exogenous shocks to form opportunities and then provide an agency with those opportunities; instead they act. This argument is also in agreement with the view that suggests that opportunities do not pre-exist and that the entrepreneur actively creates the external circumstances and the opportunity (Fletcher 2006; Gartner et al. 2003; Sarasvathy 2008). Discovery view suggests that entrepreneurs who form and exploit opportunities are significantly different than those entrepreneurs who do not form and exploit opportunities. While the creationist, acknowledges that even very small differences between entrepreneurs and nonentrepreneurs, ex ante, could lead some to form opportunities and others not to form opportunities (Alvarez & Barney 2007). For example, two individuals may be indistinguishable with respect to their attributes and characteristics, but small variations in their institutional environment and sociocultural influences– e.g., differences in institutional support, values and belief systems – might lead one of them to form and exploit an opportunity. Luck (Barney, 1986) can play a significant role in this highly path dependent process (Arthur, 1989).

In the debate on entrepreneurial opportunity identification Krueger (2003: 106,132), remarks that “If opportunities are enacted then we need to explore the cognitive processes by which we take signals from the environment and construct a personally-credible opportunity. Even if opportunities are discovered, they still need to be perceived and cognition research already offers key insights into entrepreneurial perceptions.” Baron and Ward (2004: 557) contend that the number one issue in relation to cognitive science is that of heuristic and systematic thinking by the entrepreneur; stating with foresight that “...it may be the case that successful entrepreneurs are more adept at switching between these two modes of thought as the need arises.” They (2004: 558) also advanced the question: “Do entrepreneurs have greater capacity than other persons to focus their attention on pertinent information?” “How do entrepreneurs think?” and “Do entrepreneurs develop unique knowledge structures and become experts in processing information?” (Mitchell et al., 2007) are also compelling. The discovery vs. creation debate in the extant literature has largely been conceptual in nature (Edelman & Yli-Renko, 2010). This is logical given that “it will always be possible after an opportunity is formed to describe the actions of a particular entrepreneur in both ‘discovery’ and ‘creation terms’” (Alvarez & Barney, 2007, p. 12). Empirical studies depict that environmental factors significantly affect the entrepreneurial process, leading to differences in the rates of new firm formation, survival, and growth across industries (e.g., Kirchoff, 1994; Reynolds, 1997; Reynolds & White, 1997) and countries (e.g., Bosma, Jones, Autio, &

Levie, 2008). Despite the differences in arguments and debates, the creation view has yet to produce a complete and fully developed alternative framework (Alvarez & Barney, 2007). In this context, the thesis explains an alternative view to discovery and creation.

2.5.3 The Alternative Views of Opportunity Creation

In his empirical study, focusing on entrepreneurial activities that occur in establishing companies, especially those that compete primarily in technologically advanced and sophisticated markets, Zahra (2008) attempted to explain why certain contexts are more conducive to discovery while others promote the discovery and creation of opportunities. The findings indicate that opportunity is created through science and technological development and the opportunities that emerge from such a process are worthwhile because imitation is slow. Zahra (2008) further added that as the science becomes better developed, additional business opportunities are created, alongside the development of process innovation to build on emerging scientific findings and the employment of new mechanisms to embed science into existing products, systems and process. As a result, the creation of opportunities gives meaning to scientific discoveries through successive uses of emerging results and findings. Creation of opportunities stimulates learning, transformation of science into products and interact with the market and key stakeholders. Similar findings were obtained by Audretsch (1995) and Zahra (1996a) in their studies on entrepreneurship in high technology firms that rely on science and technology to discover and create opportunities. Zahra (2008) claims that both the discovery and creation of entrepreneurial opportunities play important and reciprocal roles, exhibit different search processes, and form a self-regenerating and reinforcing dynamic cycle where discovery promotes future creation, and vice versa. He further explained how a firm can search for novelty, perpetuating the link between discovery and creation.

Though this notion is debatable, Zahra (2008) reiterated that opportunities are also discovered when entrepreneurs consider ways to revive a firm's maturing technology or reactivate dormant capabilities by integrating existing technologies or marrying old and new technologies. Additionally, the model of discovery–creation – a virtual cycle of opportunity recognition – illustrates that the discovery of opportunities can spark additional discoveries, and this exists on the stage for exploiting a process that entails considerable trial and error learning (Zahra et al., 2006). Hence, the creation can stimulate the discovery of more and varied entrepreneurial opportunities. Consequently, exploitation can also lead to the discovery or creation of opportunities (Zahra, 2008).

Additionally, the application of the conceptual framework of information processing to opportunity identification provides an answer to Krueger's (2003) question: entrepreneurs discover and enact opportunities (Vaghely & Julien, 2010). Their analysis also answers Baron and Ward's concern that successful entrepreneurs are more adept at switching between algorithmic and heuristic modes of thought as the need arises. In their findings, the sample, four out of the ten entrepreneurs are strong information processors and are at ease with both types of information treatment. They, the entrepreneurs, use problem-solving and sensemaking information applications which they combine with social interaction with their boundary Spanners and information catalysts in order to identify opportunities. With all the arguments and discussions, research has not provided a compelling explanation for the ability of entrepreneurs to continuously define, discover and create entrepreneurial opportunities. This thesis suggests that the investigation of entrepreneurial opportunity could benefit well by incorporating sensemaking as its theoretical framework. This is now outlined.

2.6 The Selection of Sensemaking Theory as Theoretical Framework

Sensemaking as a concept was initiated in the field of social psychology and has spread to a number of fields, including management and organization theory (e.g. Weber and Manning 2001, Gioia and Chittipeddi, 1991). Karl Weick is a primary promoter on sensemaking as a socio-cognitive process within organisations research. Weick describes sensemaking as 'the concept well named because, literally, it means the making of sense. Active agents construct sensible, sensible events. They "structure the un-known" (Weick 1995, p.4). How entrepreneurs make sense of situations and events determines their actions to recognize and create a considerable amount of activities favorable to profit opportunities. Sensemaking theory has its explanatory power in the organization/group and individual/socio-cognitive level focusing on organizational actors' context and situated actions of entrepreneurial opportunity (Jensen et al, 2008). This thesis, therefore, study the attitudes or behaviors and actions of individuals in opportunity creation process, and suggest to use the theory of sensemaking proposed by Weick (1995). Because entrepreneurial environments are often highly dynamic, unpredictable, and ambiguous, there is not always enough information for entrepreneurs to readily recognize and evaluate opportunities prior to exploitation (Fisher, 2012). To address this, Sarasvathy (2001, 2008) proposed the theory of effectuation as an alternative explanation for entrepreneurial phenomena under such conditions. From effectuation perspective, transformation begins with very local possibilities, thus rather than looking to select these, entrepreneurial action is seen as involving the transformation of possibilities into opportunities (Read et al, 2011). The focus of effectuation approach is on using is set of evolving means to achieve new and different goals thus evoke creative and

transformative tactics (p.7). Sarasvathy (2001) argues that individuals also employ effectuation processes when pursuing entrepreneurial opportunities. When using effectuation processes, entrepreneurs start with a generalized aspiration and then attempt to satisfy that aspiration using the resources they have at their immediate disposal (i.e., who they are, what they know, and who they know) (Perry et al, 2011).

Effectuation theory suggests that from the beginning of the entrepreneurial process individuals hold a relatively clear and coherent perception of who they are, and on the basis of this they act (Sarasvathy, 2001). Effectuation theory does however also implicitly open up for the idea that identity may change during the entrepreneurial process as the individual encounters new people, gets access to new opportunities, and gains new resources (Nielsen & Lassen, 2012). However, the theory does not explicitly address the dynamics of how new and multiple meanings that stand out from the interactive effectuation process of entrepreneurship are constantly related to identity (p.374). Consequently, this thesis, borrows an identity's notion of Weick's (1995) definition of identity as "... person's sense of who he or she is in a setting" (pp. 461), and it seeks to fill this gap of knowledge in regard to how identity unfolds in step with the entrepreneurial opportunity creation process. An identity property of sensemaking, seems to be more useful in addressing the interactions of biotechnology entrepreneurs in the process of entrepreneurial opportunity. The integration of more careful and relational considerations of identity construction during the entrepreneurial process will add considerably to the understanding of diversity and dynamics of entrepreneurial opportunity creation process. Orlikowski and Gash (1994) suggest that sensemaking theory is a useful lens for this purpose: "To interact with technology, people have to make sense of it; and in this sense-making process, they develop particular assumptions, expectations, and knowledge of the technology, which then serve to shape subsequent actions toward it" (p.175).

Nevertheless, the limitation of sensemaking is explained and this theory does not explicitly conceptualize the institutional structures in which sensemaking processes occur (Jensen et al, 2008). In the context of institutional forces (DiMaggio and Powell 1991), sensemaking offers very little detail in the explanations, mentioning the concept of the frame, which connotes past moments of experience with which present experiences are connected. (p.30). Additionally, the creative process perspective (or effectuation) and the opportunity discovery perspective (causation) are potentially dichotomous in that they represent two different sides of a coin in terms of objectivity/ subjectivity, predictive/non-predictive, and equilibrating/non-equilibrating philosophical viewpoints (Moroz & Hindle, 2012). To address this limitation, the conceptual framework in this thesis incorporates institutional forces in its

conceptual framework. While, this complement's the ability of sensemaking at the individual and socio-cognitive levels, offering strong explanations of the inter-subjective processes of opportunity discovery and creation within the complex network of actors. This idea is further explained in the conceptual framework section. The next part demonstrates the general overview of sensemaking properties and the contextual framework of the study.

2.7 The Conceptual Framework

In explaining the conceptual framework of this thesis outlines the seven organizational sensemaking properties promoted by Karl Weick (1995) that includes seven properties that builds the structure of sensemaking theory. First of all, sensemaking is grounded in terms of identity construction, which is the vital part of sensemaking. According to Thurlow and Mills (2009), through identity construction, the complex nature of social construction that is manifested in the contemporary organizational change process is emphasized. It is important to note that sensemaking necessitates a sensemaker for it to happen. The second property of sensemaking is that it conveys a retrospective process where the individuals evaluate decisions and situations. In other words, they make sense of things, and through their experiences and understandings individuals interpret the meanings. In fact, individuals will use past events and languages that are meaningful to them to help them shape their future sensemaking (Thurlow & Mills, 2009). Enactment is another property of sensemaking. It means that 'we create an activity that reflects our making sense of the experience' within our environment (Mills, 2003, p. 198). Through enactment, things which make sense of are translated into action. In other words, not only do individuals make sense of their beliefs but they also enact them (Thurlow & Mills, 2009). Further, action is a crucial part of sensemaking because it enables the environment to adhere to the people. In addition to that, sensemaking is also a social process. This is because sensemaking necessitates human thinking and the social functioning of another (Resnick et al., 1991). In other words, what one does always depends on others. Weick (1995) suggests that by paying more attention to coordination cues such as generalized other(s), stereotypes, and functional roles, one would be able to understand sensemaking. In addition, sensemaking is a process that is always happening. Therefore, it is a process that is ongoing.

The next property of sensemaking is that it is focused on and by extracting cues. As illustrated by Weick (1995), people are continuously bombarded by many cues and yet they will only notice a few, due to filters. Filters can be in the form of preconceived ideas, prior experiences that may hinder one from making sense of the available cues. Finally,

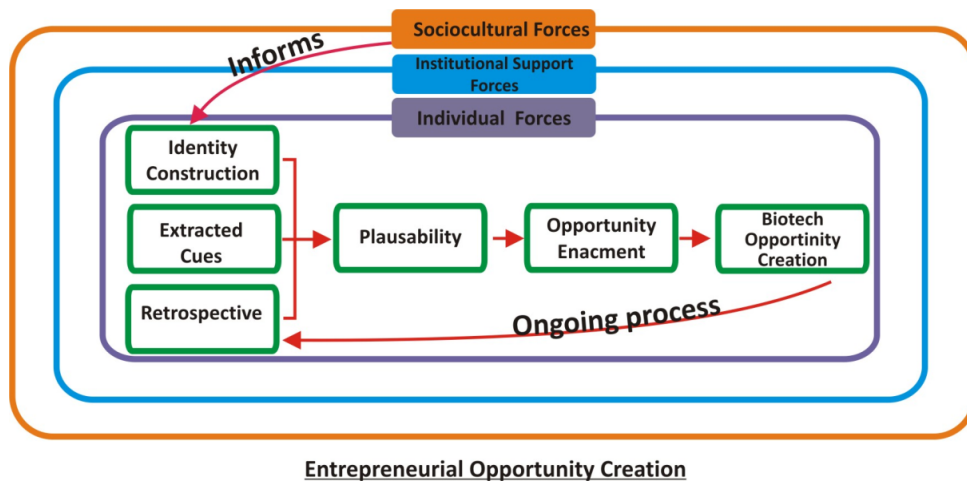
sensemaking is not driven by accuracy; rather, it is driven by plausibility. This explains that sensemaking will only occur when an individual searches for meaning in what they have experienced. Only then will the individual settle for plausibility and incorporate that understanding into future interaction. Table 2.2 summarizes the discussion of sensemaking properties and their relationship with an entrepreneurship perspective.

Table 2.2: Summary of Sensemaking from Weick's and Entrepreneurship Contexts

Notion	Karl Weick's Sensemaking Themes	Entrepreneurship Context
Identity	Crucial ingredient to the sensemaking process	Who entrepreneurs think they are in their context shapes what they enact and how they interpret events/ actions
Retrospective	Individuals interpret and make sense of events and situations using a lens of experiences and understanding	To learn what entrepreneur think, they look back over what they said earlier
Enactment	Action is pillar to sensemaking	Entrepreneurs discover and create the environment they face in dialogues and narratives
Social	Sensemaking is a social process	What entrepreneurs said, single out and conclude are determined by various social factors
Ongoing	Sensemaking never starts or stops	Entrepreneurs simultaneously shape and react to the environments they face
Extracted Cues	People extract cues from the context to help them decide on what information is relevant and what explanations are acceptable (Salacick & Pfeffer, 1978; Brown, Stacy, & Nandhakumar, 2007)	Entrepreneurs react and take action based on precedence over accuracy
Plausibility	People search for meaning, settle for plausibility and incorporate the understanding in future interaction	Entrepreneurs prefer plausibility over accuracy in the account of events and context

The conceptual framework of this study is presented in the form of the seven organizational sensemaking properties advocated by Weick (1995, 2001) and redefined through the entrepreneurship context (refer to Table 2.2). The framework (refer to Diagram 2.1) explains that these seven properties are affected by the three major forces – individual, institutional support and socio-cultural – which emerge from the key emerging issues in the biotechnology industry.

Diagram 2.1: Entrepreneurial Opportunity Creation Model



The conceptual model suggests that the interactions of these properties are shaped by the three forces that are key to understanding the phenomena of how entrepreneurial opportunity are discovered and created. As Davidson and Honig (2003) explain, there is no way one can possibly know or sample from a universe of as yet undiscovered entrepreneurial opportunities. The researcher proposes that this thesis develops indirect methods to measure opportunity discovery and creation, as suggested by Bhagavatula et al. (2010). Hence, this model adopts the indirect interpretive approach for measuring entrepreneurs' behavioral actions. This includes analyzing and interpreting from the interviews of biotech entrepreneurs elements such as stories about knowledge and work experiences (to introduce opportunity discovery), discussions on external business environmental factors (to introduce sources of opportunities), the process of handling business relationships (process of collaborative opportunities), new ideas or innovations or technologies, if they are identified as such, and facilitation of businesses through the help of others (opportunity enactments/social networks). The first theme is technological factors in the biotechnology industry in Malaysia and the ability of biotech firms to utilize technology in their business activities. The theme of technology demonstrates biotech entrepreneurs' use of it to enact profit opportunities. Additionally, the next theme of the existence of educational infrastructures such as universities and research institutes explains the idea of how biotech entrepreneurs relate themselves to these institutions in their business journey. The theme of institutional support through the intervention of government policy is something of interest to be investigated in this thesis. Consequently, the theme of the role of government's support funding through research grants, seed funding, matching grants and loans will further stimulate challenging scholarly discussions of this thesis.

Despite the growing debate on the issues of the availability of and the ease of obtaining financial support, biotech entrepreneurs acknowledge the growing importance of personal and formal networks for entrepreneurial success. This thesis is supported and enriches the notion outlined in other studies that networking contributes to the entrepreneurs' ability to discover opportunities, find resources and gain legitimacy (Elfring & Hulsink, 2001; Johannisson, 1998; Aldrich, 1989; Baum et al., 2000). Other issues were also discussed in the literature reviews, such as the passions and background of entrepreneurs that denotes the level of prior knowledge, as researched by the Austrian economists. The remaining theme is the one of socio-cultural forces, which include the entrepreneurs' values and belief systems. Consequently, this study investigates empirically the interactions of the seven organizational sensemaking properties promoted by Weick (1995; 2001) as they are affected by the three major forces of the individual, institutional support and socio-cultural forces emerging from the key themes in the biotechnology industry.

In summary, Diagram 2.1 demonstrates the underlying theoretical/conceptual framework of this study of entrepreneurial opportunity creation in the biotechnology industry in Malaysia. Diagram 2.1 presents the process of how each one of the seven organizational sensemaking properties is refined into the entrepreneurship perspective (refer to Table 2.2), interacting to enact opportunities shaping from the three major forces – individual, institutional supports and sociocultural. The model explains that entrepreneurs who think they are in their context shapes what they enact and how they interpret events/actions. Hence, this is translated as entrepreneur's identity. The enactment of sensible environments suggests that entrepreneurs discover and create opportunities within the environments they face, in dialogues and narratives. The conceptual model proposes that entrepreneurs react and take action based on precedence over accuracy; this suggests that entrepreneurs extract valuable cues from several valuable sources in their environments, in the form of market research and personal observations. The model also suggests that entrepreneurs prefer plausibility over accuracy in accounts of events and context, to recognize and create opportunities. Additionally, the model proposes that sensemaking properties are influenced by three dominant forces namely, the individual, institutional supports, and the sociocultural forces.

Sensemaking is a social process (Weick, 2001), and it suggests that what entrepreneurs say, single out and conclude are determined by various social factors including values and belief systems. Consequently, this is an iterative process in which social forces shape entrepreneurs' identity and entrepreneur's venture identity to enact opportunities. The model suggests that sensemaking properties are all interconnected and are part of an ongoing

process which never starts or stops (Weick, 2001). The model then explains that in the event of opportunity discovery and creation processes, entrepreneurs simultaneously shape and react to the environments they face. The primary aim for this conceptual framework is to fill in the gap and to answer the question of how entrepreneurs discovery and create business opportunities in the context of biotechnology industry in Malaysia.

2.8 Conclusion

The literature has acknowledged that entrepreneurship has long been associated with economic progress and the entrepreneurship in a unique individual who possess certain attributes and characteristics that are superior to others (Schumpeter 1934; Kuratko & Hodgets, 2001). The literature also shows that entrepreneurship could be affected by environmental factors such as society's specific cultural values and beliefs, social attitudes towards entrepreneurship, the existence of successful entrepreneurs, the parental roles, the exposure to entrepreneurship at younger ages, the networking and the governmental influences (Shane, 2003). The introduction of the concept of opportunities has changed the focus of the field of entrepreneurship over the past ten years (Shane, 2012) Research has focused less on the characteristics of entrepreneurs and more about the characteristics of opportunities (Mitchell et al., 2004; Soh, 2003). However, as McMullen et al. (2007) and Davidsson (2004) highlight, this advance has been limited in many ways. To date, little work has explored the sources of entrepreneurial opportunities, and, as a result, we know little about why there are more opportunities in some places or at some points in time than at others (Shane, 2012). He claims there is little work describing entrepreneurial opportunities (p. 16). It is also glaring to note that conceptual theories on entrepreneurship have been contributed mainly by scholars from the western developed countries whose reasoning could be largely shaped by their different individual, institutional support and socio cultural experiences. This could rather make their theories unsuitable to emerging economies such as Malaysia as entrepreneurship or opportunity creation could not be judged in isolation of its environments. In summary, the review of literature demonstrates that there is a significant gap in knowledge on issues associated with entrepreneurship and entrepreneurial opportunity. Despite the conceptual and empirical analysis, the debates on the whole idea of entrepreneurial opportunity has yet to produce a complete and fully developed alternative framework (Alvarez & Barney, 2007). In so, this thesis is to address this by approaching entrepreneurial opportunity from the perspectives of the three different forces – individual, institutional support and socio-cultural – using sensemaking theory. While, the next chapter, Chapter Three, presents the review of the analysis of biotech studies.

Chapter Three

The Review of Entrepreneurship Studies in the Biotechnology Industry

3.0 Introduction

The first aim of chapter three is to provide an analysis of entrepreneurship studies in the biotechnology industry. To address this aim, it examines the research development of the biotechnology industry. Secondly, the aim of this chapter is to analyze key academic issues in the biotechnology industry. This chapter also investigates relevant studies that represent entrepreneurship in the biotechnology industry. These studies were identified and selected based on the importance to the aims of this thesis to understand the key entrepreneurship issues focusing on the biotechnology sector. The researcher identifies relevant and related articles to the domain of entrepreneurship in biotechnology that were published in PhD theses, databases, and highly cited entrepreneurship journals, including “the Big 5” (Katz, 2003): *Entrepreneurship and Regional Development*; *Entrepreneurship: Theory and Practice*; *Journal of Business Venturing*; *Journal of Small Business Management*; and *Small Business Economics*. Based on the literature searches, most articles were either focusing more on the technical aspects of biotech, or emphasizing on the economic parts of the analysis for an example. This suggests that only seventeen articles/analyses empirically discussing entrepreneurship factors in the biotech sector were chosen in this chapter. The seventeen most relevant articles were selected for analysis based on their relevance to the overview of entrepreneurship study in the biotechnology setting. The rationale for the chosen topics in this chapter is influenced from the core theme of the studies/articles. The core themes are refined and grouped into relevant topics to support the analysis of the literature review process.

3.1 The Reviews of Entrepreneurship Studies in the Biotechnology Industry

The domain of entrepreneurship as a field of study has been in existence in many areas across other industries. The interests of entrepreneurship scholars to examine entrepreneurship issues migrate across other disciplines and industries such as those surrounding the biotechnology industry. The reviews specifically on entrepreneurial opportunity in the biotechnology context in Malaysia is either very limited or non-existence. Thus, examining the general overview of general entrepreneurship issues helps identify key areas that are found to be dominant in academic studies of entrepreneurship in the biotech industry. The analysis in this chapter suggests that the key areas identified are institutional

issues on new business creation, strategic alliance, commercialization strategies, and SMEs in the biotech industry.

3.1.1 SMEs in the Biotech Industry

There has been a significant amount of research and discussions pertaining to the entrepreneurial issues in the biotech industry and yet a literature review still indicates a lack of empirical study in the areas of biotech entrepreneurship in Malaysia. In fact, the most recent study pertaining to this area is the one conducted by Abu Bakar (2007) in which he analyses the role and importance of small and medium enterprises (SMEs) in the biotechnology industry in Malaysia. In his unpublished thesis entitled 'Factors contributing to the success of biotechnology SMEs in Malaysia', Abu Bakar (2007) emphasizes that biotechnology-based SMEs are the key players in the emerging biotechnology sectors, arguing that the success of biotech SMEs is crucial to the growth, stability, and general well being of this sector. The research findings identified significant differences between biotechnology and non-biotechnology SMEs. The finding suggests that biotechnology entrepreneurs are significantly different from their non-biotechnology counterparts in the areas of the owner–manager's related sectoral experience, and R&D activities (Abu Bakar, 2007).

The study also indicates that compared to their counterparts, biotechnology entrepreneurs are found to have more work experience; this is aside from other differences that also exist – age, size, external financial capital access, government assistance, image, linkages, networks, integration, innovation and perception of the external environment. In order to survive and create competitive advantage, SMEs of all sizes must reach out into their external environment for necessary resources. When the requisite resources cannot be readily obtained from the external environment, both theory and research tell us that SMEs and firms of all sizes form strategic alliances with firms with complementary resources (Dickson et. al., 2006, p.488). It is important to note that since SMEs are newer and smaller in size, they are likely to be more forward integrated and have a stronger corporate image. Young, new and smaller firms are compelled to promote social interactions within their organizations, and with external organizations in order to sustain the additional learning costs involved in new roles and new tasks (Stinchcombe, 1965). The liability of newness may seriously compromise firm growth rates and eventually lead to mortality (Thornhill and Amit, 2003: 505).

Abu Bakar (2007) suggests, in terms of innovation, biotechnology SMEs tends to fall behind non-biotechnology SMEs. For instance, biotechnology SMEs' activities are less extensive when compared to their counterparts – the non-biotechnology SMEs – in spite of their extensive linkages and networks with academic research institutions, individual researchers, and other private enterprises. Furthermore, he argues that organizational structures, enterprise image, internal and external networking, backward integration strategy, and innovation activities were among the factors that affect the success of Malaysian biotechnology SMEs. To nullify this disadvantage and in this context, Cefis and Marsili (2005) emphasize innovation as an important option for young firms (adding emphasize SMEs), stressing that innovation balances the liability of newness by providing a premium which enables them to survive. Comparatively, in the case of most European companies specialized in biotechnology are small or medium-sized enterprises (SMEs) and as in many other sectors, SMEs have considerable innovative force and dynamism, but lack the resources that may be at the disposal of larger, incumbent companies (EC Enterprise & Industry, 2012). However, young firms and SMEs may find it difficult to release resources for highly uncertain in-house research and development (R&D) activities which will restrict their ability to introduce innovations (Laursen et. al., 2010). Young firms must seek alternative ways to innovate, one of which might be to invest in external R&D (p. 4).

Investing in external R&D has been shown to be efficient for achieving high innovative performance (Cassiman and Veugelers, 2006; Jones et al., 2001; Sobrero and Roberts, 2001; Tsai and Wang, 2008). Additionally, even if establishing R&D relationships with other actors has been proven to be critical for innovation success, young firms and SMEs may find it difficult to engage in these kinds of arrangements with other agents/organizations in society (Stinchcombe, 1965). Comparatively, the growth of biotech SMEs in Europe is held back by three main constraints; Europe's fragmented patent system, which makes it burdensome and costly to file and defend patents, the insufficient supply of risk capital in Europe and shortcomings in the cooperation between science and business thus are also driven by the trouble of turning scientific research and discoveries into marketable products in Europe (EC Enterprise & Industry, 2012). Strong and effective relationships between scientists and business or SMEs are eminent yet demands trust from both parties. Trust is one of the prerequisites for creating good professional relationships (Nguyen and Rose, 2009) and is a resource that takes effort, time and experience to build (Laursen et. al., 2010). Additionally, there are also other institutional issues that affect biotech entrepreneurship activities.

3.1.2 Institutional Issues in Biotechnology Entrepreneurship

In a study by Lynskey (2006) it was evidenced that institutional factors influenced biotechnology entrepreneurs in the form of institutional facilitation. The study demonstrates that institutional facilitation and other institutional changes are conducive to and support entrepreneurship activities, and have developed alongside an increase in the number of biotechnology venture firms. The study also investigates the founders and chief scientists and presents an overview of institutional facilitation and transformations, in the light of deregulation and legislative changes in Japan. Lynskey (2006) posits that the emergence of bio-venture firms, the increase in their number and, arguably, their changing nature are manifestations of the co-evolution of organizations with changes to the institutional framework. Bartholomew (1997) articulated how national institutional patterns, such as access to educational institutions, the accessibility of sources of finance, and the availability of pools of educated labor, help to determine the manner in which biotechnology innovation emerges in a country; and Lehrer and Asakawa (2004) highlighted the additional role of the public sector.

Similar efforts are demonstrated in the biotechnology setting in Malaysia, in the National Biotechnology Policy (NBP), through the Malaysian Biotechnology Corporation (MBC), including the allocation of funds and grants to biotechnology entrepreneurs and easing regulations to attract more biotech expertise or human capital to facilitate the growth of the industry. Young firms encounter many hazards and their short-track record reduces the possibilities for outsiders to evaluate their potential (Baum et al. 2004), hence, institutional facilitation and intervention through financial assistance help speed up the development their activities. New businesses (including biotech venture) must resolve the problems related to information asymmetry (Certo et al., 2001), signal the presence of effective monitoring mechanisms (Deutsch and Ross, 2003) and compensate for lack of experience and reputation (Honig et al., 2006). While this requires effective institutional support and one of the basic functions of institutions is to provide incentives through norms and regulations [to enable social capital among new firms] (Scott, 1995; Edquist & Johnson, 1997). This is recalled by the definition of the Organization for Economic Cooperation and Development (OECD, 1994) of the concept of 'social capital':

The overall innovation performance of an economy depends not so much on how specific formal institutions (firms, research institutes, universities, etc.) perform, but on how they interact with each other as elements of a collective system of knowledge creation and use, and on their interplay with social institutions (such as values, norms, and legal frameworks). (p.4)

Lynskey's (2006) study evidenced how specific formal institutions (i.e. Firms and universities interact in a collective system of knowledge creation and use in which issues of commercial vehicles, and commercial links among biotech ventures in Japan were examined. One key finding in the study demonstrates the role of the biotech venture; that it may act as the commercialisation vehicle for a wide network of university researchers. Lynskey (2006) explained further in his statement:

Five of the 15 firms relied on close cooperation with professors in more than one university for their key technologies. Five other firms had important ties to laboratories in at least one Japanese university. This suggests that personal connections and trust are often sufficient for a Japanese bio-venture to draw upon the research of a network of academics. Distinguished, retired professors managed two of the five firms that relied upon extensive academic networks, and it was not surprising that such well-known academics could depend upon longstanding connections to support their firms. (pp. 1405–1406)

The issue for biotech entrepreneurs in Japan is to create close ties of business networks were their personal connections. Personal connections help to lead entrepreneurs towards business opportunities. Social capital may help the firm to locate and evaluate opportunities (Elfring and Hulsink, 2003). Moreover, in a geographic area with high levels of social capital, it is more likely that the entrepreneur has some established relationships and some reputation which is able to secure tangible commitments from otherwise skeptical resource holders (Portes and Sensenbrenner, 1993; Shane and Cable, 2002; Stuart and Sorenson, 2003; Zimmer and Aldrich, 1987), such as suppliers of technologies and R&D. In general, external actors are more willing to share knowledge when the context is characterized by high levels of social capital which facilitates the transmission of more sensitive and richer information (Krackhardt, 1990). In fact, the effectiveness of the external knowledge acquisition depends on the willingness of other actors to share useful information and resources (Dyer and Singh, 1998; Yli-Renko et al., 2001). Networks and trust that are developed over the passage of time enhance the strength of Japanese academics to make sense of the technology and to translate it into business opportunities. The trust provides the confidence that the knowledge shared will not be appropriated or misused (Krackhardt, 1990; McEvily et al., 2003).

While on the issue of institutional support, the survey from Lynskey's (2006) study evidenced that Japanese venture firms relied almost exclusively on bank loans, various government grants and subsidies, and personal capital injected by the founding entrepreneur(s), rather than venture capital (VC) funding (p. 1410). This study complements a similar finding by Muller et al. (2004) on bio-entrepreneurs and industry experts (consultants or technology transfer managers) in Germany and Japan. According to their study, the government in

Germany promotes entrepreneurship through providing grants and low-interest loans or through tax incentives to new ventures but, on the other hand, rules and regulations established by the government may discourage entrepreneurs from starting a new business (p. 96). For example, in the early days of biotechnology in Germany, strict regulations on biotech research motivated large pharmaceutical companies such as BASF to establish research centers in other countries such as the US. Nevertheless, in the case of Germany, venture capital investments in high-technology sectors such as biotech were facilitated through generous co-financing options available through the German government-owned banks. Muller et al. (2004) argue that in Japan the situation is different compared with Germany. They posit that venture capital plays a minor role in the establishment of biotechnology companies in Japan, hence there is no culture for entrepreneurship yet, and lifelong working for one large company is still the career ideal for many Japanese graduates, so that entrepreneurial spin-offs from academic institutions are few (p. 99).

Additionally, McEnrue's (2011) study focuses on government policies affecting entrepreneurial activity among scientists engaged in biotechnology research in Kenya, a developing country in sub-Saharan Africa (SSA). Using Audretsch et al (2007) model of entrepreneurial activity, the study maps existing research derived from multiple academic disciplines against a theory of entrepreneurship that seeks to explain entrepreneurial activity in a modern economy. The analysis synthesizes information regarding six channels of government intervention culled from 250 sources. The contributions of the study, firstly comprehensive review of academic research dealing with government intervention aimed at increasing entrepreneurial activity among scientists engaged in biotech research in Kenya. This includes studies reported across multiple academic and professional fields in addition to life science. Secondly, McEnrue's (2011) analysis places extant research on government intervention to enhance bioentrepreneurship into the context of existing theory. The study posits that there is *a lot of recent government activity* in Kenya, that is designed to enhance the development of science and technology including biotechnology. The analysis provides an opportunity to gauge the extent to which government policies have survived, conflict and/or complement each other (Kaiser and Prange, 2004). In contrast, most research on science and technology focuses either at the level of the institution within which scientists work (the university or public research organization) or examines the innovation system within a nation or across nations (McEnrue's, 2011).

3.1.3 Leveraging Opportunities Through Strategic Alliance

A study by Deeds and Hill (1996) view that strategic alliances represent a viable way for firms to gain access to the complementary assets required to enhance their rate of new product development. In other words, through strategic alliances, biotech firms could gain and control access to other important resources such as early cash flows, external visibility, legitimacy, and early market share. By having such gain and control, biotech firms could enhance their product development processes and regulatory cycle. However, Deeds and Hill (1996) did not consider the risk of non performance, a situation that can occur when, for example, the firm's partner fails to fulfil their part. For instance, the firm's partner could be supplying the firm with mismatched assets or the partner could simply be taking advantage of the firm while imparting no or minimal positive contribution to the alliance. It is important to note that in order to gain deeper insights into the issue of alliance, other methods need to be taken into consideration. Additionally, new product development involves various phases. Therefore, this could limit Deeds & Hill's (1996) study. In another related study on business–university alliances conducted by George et al. (2002), identifies that universities play a key role in giving birth to biotechnology and later support the creation of new companies to exploit its discoveries. In other words, the university is the agent that initiates change in the environment of biotech business operating. As an agent, the university provides support through advanced technological research and human capital assistance that could be in the form of business–university links. George et al. (2002) further support the idea that having effective business–university relationships with educational institutions can improve product development and other key indicators of a company's innovative outputs, such as patents that could further translate into new profitable products or services. Also, a university that is generally perceived as a center of knowledge and R&D is usually expected to manage the business–university alliance.

Furthermore, this study demonstrates that all these allow biotech firms to attract more technology alliance patterns and to reduce their R&D expenses. However, the business–university relationship has one significant drawback: linkages are considered costly. In terms of inter-organizational factors and the formation of international research alliances, the study of Al-Laham and Souitaris (2008) highlights the differentiation between local and national ties, extending the contingency perspective in organizational networks. This is in line with Gulati and Higgins (2003) who further argued that different types of ties matter differently and that we do not know enough about the contingency value of ties in the organizational network. These studies show how a business could benefit from local and international ties by highlighting the importance of networks as a driver of internationalization via a research

alliance. In a study on commercialization strategy in the biotechnology, Batterham (2000) and Sainsbury (2002) argue that entrepreneurship and innovation are major factors in all stages in the development of such companies. The essence of their study suggests that entrepreneurship and innovation were important characters in the process of the company's development. Consequently, similar study by Breznitz et al. (2008) was conducted in a study in the US of four of the world's top-ranked universities, namely the Massachusetts Institute of Technology (MIT), Boston, New Haven and Yale. The study discovered that a university plays a role as a social agent via technology transfer. The success stories of these four universities in university–technology transfer relationships are associated with cultural norms and the creation of a bottom-up entrepreneurial culture (Breznitz et al., 2008). The study posits that enabling environment in these institutions with the supports from the university's leadership, motivates the staffs to engage in the process of university-technology relationships.

However, the limitation of this study was reflected on the small size samples with only four universities studied narrowly focused on selected universities in the US. Nevertheless, the findings affect the process of generalization to a wider context of this study particularly to other countries. In a related study by Rothaermel and Deeds (2004), using the exploration–exploitation framework in biotechnology firms, they argued that the process of commercialization in biotech firms is closely related to the unique characteristics of the biotechnology industry, such as the long product development time and regulatory approval cycle, and heavy reliance upon often basic scientific research. In other words, at the early stage of existence where biotech firms are still early in their product life cycle, the firms rely predominantly on external funding. Therefore, at this stage, biotech firms attempt to communicate and collaborate with other actors to gain vital resources such as external funding, technology, and market penetration, and hence, strategic alliance. While, Rothaermel and Deeds's (2004) study demonstrates well on the importance of securing valuable resources to be competitive, the study was lacking on explaining the functions of knowledge to biotech firms. Additionally, in a study by Sampath and Oyelaran-Oyeyinka (2010), they investigate the role and importance of learning in knowledge generation (to compare innovation and entrepreneurship experience), following the path from the laboratory to the market in biotechnology in Nigeria and Ghana. The study suggests that the quality of physical infrastructure and knowledge infrastructure (including appropriate human skills), in addition to institutions and incentives for innovation, contribute in large part to the observed processes of innovation success. The study posits that regardless of whether the initiating step is the incremental design or the laboratory-based R&D stage, these factors are critical determinants of commercialization. In both countries, Nigeria and Ghana, Sampath and

Oyelaran-Oyeyinka (2010) identified three factors as to why the innovation process remains at the level of pre-commercialization. First, it was the lack of facilities and financing to move the research to the concluding stages. Second, the study demonstrates situations where significant research results had been collected, with evidence of the possible utility of the process and product, but there was no demand by the end-users. Third, it was identified that failure to commercialize research outputs sometimes results from institutional rigidity, which often relates to the way that traditional universities and research institutes are set up.

The study of Sampath and Oyelaran-Oyeyinka found influences from institutional factors. One visible example was low industry involvement, for the reason that private sector research is in need of basic support such as sources of finance (e.g. From VC), better basic infrastructure, and technology diffusion activities that could enhance the internal capacity. The study claims that the lack of collaborative interactions between industry and public research is a result of a lack of information and an absence of incentives amongst researchers to indulge in joint research. Sampath and Oyelaran-Oyeyinka (2010) posit that universities also do not collaborate sufficiently with users of knowledge. In such situations, the study's empirical research shows that innovation success often depends on a serendipitous accumulation of capabilities or collaboration capacities that remain one-off and unsystematic. Research on biotech firms has been largely dominated in the area of business-university alliance (Deeds and Hill, 1996; George et al., 2002; Rothaermel and Deeds, 2004; Al-Laham and Souitaris, 2008). Many studies have been conducted in an attempt to understand strategic alliance (formation) in the biotech industry. For an example, Baum and Silverman (2004), investigate the effects of start-ups' alliance, intellectual, and human capital characteristics. The study concludes that the venture capitalist serves as an effective "scout" or "coach" in the biotechnology industry. The study posits that venture capitalist's role is far more than a funder but went beyond that boundary to facilitate biotech firms to the next stage of business. Baum and Silverman (2004) view that the roles of the venture capitalist includes recognizing highly potential firms and funding, and coaching these firms to the next step of the business cycle. These notions are similar to those of earlier researchers who suggest the benefits of alliance formation to biotech firms in the context of intellectual and human capital developments. In another related study, Woolley and Rottner (2008), review the role of policy initiatives towards biotech industry. The review suggests that the policies that relate to science and technology (S&T) and economic initiatives in the creation of nanotechnology firms in the US led to six times as many firms being founded as in those states without such initiatives. The states that are most attractive to entrepreneurs not only pursue technological innovation and provide resources, but also encourage and legitimize commercial development (Woolley and Rottner, 2008). This notion enriches the

role of institutions in facilitating entrepreneurial activities and adds value to Van de Ven's (1993) earlier study on the infrastructure of the entrepreneurship model. Despite of that, only two categories of Van de Ven's (1993) infrastructure of entrepreneurship model were tested. The third category of this model, which is proprietary activity, was discarded even though Van de Ven (1993) had stressed the importance of all of these three categories as they are interdependent. Therefore, Woolley and Rottner's (2008) findings could be insufficient.

The issues of start-up and policy in biotech evolve further into the area of biotech clusters. There are two types of clusters in the context of success factors in the biotechnology industry, namely spontaneous and policy-driven clusters, as investigated in a comparative study by Su and Hung (2009). The study compares start-up and policy issues in the Bay Area in the US and Shanghai Zhangjiang Hi-Tech Park in China. Su and Hang (2009) depict that entrepreneurship has been a driving force in the Bay Area, US, for a long time as the economy is built on an 'unparalleled culture of entrepreneurship'. The study demonstrates that the culture of entrepreneurship in that area is driven by policy-driven clusters to enable people to engage in entrepreneurship related activities. Earlier, Stuart and Sorenson's (2003) investigates the regional differences in the US and China, looking at determinants of the local founding rate, in which entrepreneurs assemble the resources to start new companies. These differences indicate the effects of cultural norms in entrepreneurial activities, as the study tries to address the existence of entrepreneurship cultures in China and the US. Su and Hung (2009) also found relatively high rates of predicted Initial Public Offerings (IPOs) and new venture creation in the Bay Area, US, but not in Shanghai Zhangjiang Hi-Tech Park in China. The study views, unlike the US, entrepreneurship is still the 'missing ingredient' in most Chinese science and technology industry parks. Moreover, despite the strength of this study, it is still doubtful as to whether understanding the evolutionary mechanism as a theoretical tool is sufficiently and comprehensive enough to support the propositions to socio-technological change in the context of biotechnology clusters.

In another study, Oliver (2004) investigates biotechnology entrepreneurial scientists and their collaboration with Israel. The study focuses on the new scientific entrepreneurial spirit in the universities and the industry. It explores the features of entrepreneurial scientists and the relationship between existing scientific collaborations and the scientific and intellectual capital of the scientists, as well as the impact of the characteristics of the institution where they are employed. Oliver's (2004) study focuses on biotechnology-related scientists (in academic and non-academic settings) actively searching for new collaborations. The study posits that organizations with a higher rate of collaborations seem to have larger laboratories

with students of all levels. The evidence presented in the study shows that most scientists in Israel had little or no industrial collaborations, and the intellectual capital and institutional factors were best linked to the institutional factor of academic collaborations. While, in this case institutional forces shape the process of opportunity creation of biotechnology ventures, resulting in more university–industry collaborations in Israel. In short, the role of institutions is eminent in facilitating the challenging biotech based activities. With long gestation period and new biotech firms suffering of the reality of newness, institutions act as facilitator for biotech entrepreneurs while providing a conducive environment for all actors in the industry. In the Malaysian context, MBC repositions the biotech initiatives drafted by the Malaysia government by emphasizing better cooperation between science and business with a strong focus by providing business matching and mentoring programs. Henceforward, to explain how entrepreneurship policy evolves and emerges in Malaysia, the next part of the analysis helps explain the importance of policy towards opportunity friendly environment conducive in stimulating entrepreneurial activities.

3.2 The Evolution of Entrepreneurship Policy in Malaysia

With a number of academic reviews done on biotech focusing on issues of strategic alliances, firm formations, and policy, this chapter could benefit as well by looking at a different paradigm for the study. For an example, this part evaluates the evolution of entrepreneurship programs and policy in Malaysia. The objective of entrepreneurship policy is to motivate more new entrepreneurs with the focus to inculcate an entrepreneurship culture/climate (Stevenson and Lundstrom, 2001). Traditionally, enterprise policy has been centered on business start ups and support for small-business growth (Audretsch et al, 2007; Stevenson and Lundstrom, 2001). SMEs is seen as wealth and employment creators in need of specific assistance to help them survive and grow (Bridge et al, 2003). Many countries, including Malaysia, are now exploring further what they need to do to create a vibrant entrepreneurship culture and increase the supply of new entrepreneurs (and hence new business creations). Most entrepreneurial development initiatives continue to be influenced around programs to enhance individuals' competency skills, integrate entrepreneurship into national economic development efforts, use the education system to shape and encourage future entrepreneurs, incubate entrepreneurial firms, invest in diverse sources of activities as well as creating the infrastructures, and create a competitive tax policy and regulatory climates. The evolution of entrepreneurship, as both concept and activity, has been growing in importance in Malaysia. The perceived importance of entrepreneurship to the growth of Malaysia's economy is evidenced by the total amount and variety of supporting means and policies that exist for entrepreneurs, including funding,

physical and human capital infrastructures and business advisory services. For example, the establishment of a special ministry for entrepreneurs, the Ministry of Entrepreneur Development in 1995, clearly presents the importance the government places upon the issue of entrepreneurship and entrepreneur development.

The Ministry of Entrepreneur and Co-operative Development (MECD) is the prime institution in the development of Bumiputra¹ entrepreneurs. The history of MECD goes back to 1974 when with the establishment of the Ministry for the Co-ordination of Public Corporations, but just two years later it was renamed to the Ministry of Prime Industries (MPI). The MPI was responsible for facilitating, monitoring and coordinating the activities of public enterprises such as Majlis Amanah Rakyat (MARA) and the urban Development Authority (UDA). Although there are many initiatives and financial support systems for entrepreneurs, they are perceived as not been as effective as they should be. A common issue is the extent of the organizational bureaucracy or “red tape” with which entrepreneurs must cope with, causing delays in getting approval or supports for applications. Mohd. Rosli (2000) views, the earnestness with which the government promoted entrepreneurship and its SME development programs in the early days led to the involvement of a large number of ministries as well as government and non-government agencies. He cites Chee (1990) who estimated that there were about 13 ministries and more than 30 government and non-government agencies involved in a variety of programs for the development of SMEs in 1990. The large number of ministries and government agencies involved undoubtedly encourages overlapping of functions and responsibilities, promoting unproductive and ineffectiveness of the programs/initiatives being run. To address this issue, the Malaysian government in 1995, establishes a special vehicle known as the Small and Medium Scale Industry Development Corporation (SMIDEC), to facilitate and moderate the task of planning and implementing all the initiatives pertaining to SMEs. SMIDEC’s responsibility was the handling, supervision and streamlining of vendor development programs and franchising, incubator premises, loans, the provision of factory sites, entrepreneurship training and use of technology. Consequently, in March 2004, reshaping exercises involving MPI saw the selection of a new name for the Ministry, thus the emergence of the Ministry of Entrepreneur and Co-operative Development. The aims of MECD are threefold. Firstly, the objective is to engage in entrepreneurial acculturation activities which include implementation of the acculturation programs, entrepreneurial training, and enhancement of business and technical skills and technology. Secondly, is to promote activities that lead to business opportunities to the Bumiputra, and finally is providing institutional support and assistance

¹ Indigenous or man of the soil.

program which includes advice and guidance, promotion and marketing and financing. Nevertheless, Malaysia has gone through different stages of economic, policy and vision transformations. Biotechnology is one niche area that is considered by the Malaysian government as an area of focus.

3.3 The Development of Biotechnology Policy in Malaysia

The transformation is a process perceived by many Malaysians as the ability of Malaysian leaders to shift the economic emphasis from being predominantly agriculture-based into manufacturing-based hence later into a knowledge-based economy focusing on biotechnology-based activities. During the era of the former Prime Minister, Tun Dr. Mahathir Mohammad, the Malaysian government introduced initiatives to propel information and communication technology based activities through the Multimedia Super Corridor (MSC) project. This billion-Ringgit multimedia initiative was developed in an area called Cyberjaya (located near the capital of Malaysia, Kuala Lumpur) and mainly hosts many established local and international information and communication technology (ICT) companies engaging in research and development and commercial business activities. Some observers have noted that the MSC Malaysia initiative takes the best elements of the country's highly successful industrialization program introduced in the early 1970s (Tze Kheong, 2009). The government emulates similar ICT clusters in other regions within Malaysia to try to create more business opportunities. Narrowing the gap in scientific and technological research is challenged not only Malaysia but also issue of European countries (refer to EC Enterprise & Industry, 2012). To address this, MSC project is but one component of the national initiative to close this gap (Tze Kheong, 2009). However, in May 2008, there was a leadership change from former Prime Minister Dr. Mahathir to the former Prime Minister Abdullah, and the country observed a significant shift of interest from the MSC back into agricultural activities but with an emphasis on the biotechnology industry. On 3rd April 2009, during the current Prime Minister, Najib, the country was affected by the global financial crisis but Najib decided to continue his predecessors' efforts to move both the MSC and the biotech initiatives to the next stage.

Additionally, countries in Asia such as Singapore, India and Malaysia are now strongly committed to developing their biotechnology centers (Heong, 2004). Malaysia's efforts with biotechnology activities have been dismally slow and hampered by a number of setbacks. The biotechnology sector in Malaysia is still in its infancy and occupies a market share of less than 0.5 per cent of the total biotechnology revenue in the Asia Pacific region (Rajen, 2006). In the global economic context, Gormley (2009), in his article reporting on the study

by French research group Alcimed, conducted on behalf of the European Biopharmaceutical Enterprises (or EBE), posits that more than half of Europe's small biopharmaceutical companies are already feeling under threat from the global financial crisis. Based on the EBE report, the healthcare biotechnology sector needs at least €2 billion per year in Europe alone from private or government funding to maintain current levels of innovation. The report from Frost and Sullivan (2009) argue that the Malaysian government faces serious challenges that may hamper its biotech ambitions and these include political, socioeconomic and environmental factors. The biotech initiative may be affected if the Malaysian government decided to reduce its budget on biotech activities in the event of the global financial crisis. Consequently, Abuduxike et al. (2012), suggest that Malaysia is facing many critical challenges such as; 1) lack of funding was the most common challenge for all the small medium start-up companies, 2) lack of human capital and essential skill sets was the major barrier for this knowledge driven industry to growth, 3) poor linkages/interactions between public and private sectors was the main reason for the huge gap in knowledge creation, dissemination across sectors and the root of the conflicts in identifying niche areas, 4) lack of clear regulatory paths/ guidelines for the companies to register their products to access the local market and 5) lack of knowledge on biotechnology and related aspects among government officers, decision makers. From the environmental perspectives, there are increasing pressures on biotechnology firms to address issues such as genetically modified organisms (GMO) that may hinder biotech initiatives at the national level (Frost & Sullivan, 2009). The Malaysian government recognizes the importance of this industry by making intervention through policy and regulatory efforts in developing the industry and ensuring public safety.

As an effort to catalyze biotechnology industry development, the government has been playing a proactive role in shaping the regulatory agenda by recognizing and acceding to several international conventions and protocols related to biotechnology, such as the Convention on Biological Diversity and the Cartagena Protocol on Bio Safety, ratified in 2003. This convention was held as a measure to protect the country from potential risks of living modified organisms (LMOs). As highlighted in the MBC Annual Report 2008, four regulatory initiatives were put in place, namely, Bio Safety/Access and Benefit Sharing, International Accreditation, Pharmaceutical Regulation and Intellectual Property. Specifically, the first initiative, which is the formulation and adoption of a formal Access and Benefit Sharing (ABS) framework, has been developed to enable the preservation of Malaysia's biodiversity and to prevent bio-piracy (MBC, 2008). This formulation enhances Malaysian biotech industry to the international standard of biotechnology. The second effort is to produce a Guidance Document as a regulatory measure to build capacity amongst

regulators as well as the industry, and also to encourage herbal medicine researchers better to understand the regulatory framework involved (MBC, 2007). The following initiative, which is an Intellectual Property management, focuses primarily on improving the state of affairs in relation to more pressing issues such as enforcement, the backlog of patent application files and the lack of awareness about Intellectual Property commercialization (MBC, 2008). This issue affects the focus of biotech firms in creating good and innovative products or services to delivering them to the market. To address these challenges, BIOTEK is established in 2001 to facilitate the process of commercializing biotechnology and for positioning Malaysia to be the leading center of biotechnology (BIOTEK, 2001). BIOTEK introduces the Biotechnology Research & Development Grant Scheme, with a total of RM95.3 million allocated for 47 biotechnology research projects (Table 3.1) where 11 of these projects were classified as ready for commercialization.

Table 3.1: Public R&D Projects on Biotechnology, 2001–2005

Focus Area	No of Project	Grant Approved (RM Million)
Genomics & Proteomics	8	17.9
Plant	4	8.6
Animal	12	17.3
Medical	8	18.9
Bio Pharmacy	5	3.2
Environment	2	3.8
Food	4	6.4
Natural Products	4	19.2
Total	47	95.3

Source: Ministry of Science, Technology and Innovation, Malaysia.

27 patents were filed in Malaysia and one was filed internationally. Acknowledging the important role of entrepreneurship, the Malaysian government decides to establish a new program to incorporate entrepreneurship as part of the biotech effort in Malaysia. As a result, in 2005 the government created three new mechanisms to facilitate growth and development in the domestic biotechnology industry. The initiatives are threefold: creating the National Biotechnology Policy (NBP), establishing a vehicle to manage and operate the policy via the MBC, and introducing BioNexus status, an accreditation program for biotech firms that meet certain criteria and standards. NBP's role is to exploit the competitive advantages and enable the policy implementation, with active participation of the government–private sectors. The NBP was first set up by the Malaysian government to shape and enable institutional, regulatory and financial frameworks to promote biotechnology as a major driver

of sustained economic growth, intensifying human capital development (MBC, 2009). The policy is also designed to put the industry into a proper perspective, by creating and increasing the value of Malaysia's agricultural sector and the commercialization of Nutraceuticals and pharmaceuticals derived from bio-products, leveraging the strength of manufacturing by improving "opportunities in bio-processing and bio-manufacturing"(Badawi, 2005). The government's intervention within the field of entrepreneurship is inspired by the view that the entrepreneur is the solution to weak economic performance and poor levels of job creation (Audretsch et al, 2007; Birch, 1979; Bridge et al, 2003; Gilbert et al, 2004; Henrekson, 2007; Holtz-Eakin, 2000; Verheul et al, 2001). One of the many goals of biotech initiatives in Malaysia is to enable various agencies and institutions to facilitate the job creation process. To enable these institutions, the Malaysian government has entrusted MBC to ensure the success of this initiative. Smeltzer (2008), in his report, suggests that the NBC and MBC are expected to guide the Malaysian biotechnology industry towards creating 200,000 new jobs in agriculture, healthcare, industrial biotechnology and Bioinformatics. Referring to Table 3.2 and as of 2009, approximately 54,000 new jobs have been created in biotech and related industries and this was a contribution of 2 per cent to the total Gross Domestic Product (GDP) of the country. This affects the economy by increasing the upstream and downstream business activities, while enabling active participations between private and government institutions.

Table 3.2: National Development Policy: The Development Goals (2006–2020)

Development Goals	Phase I (2006-2010) Capacity Building	Phase II (2011-2015) Science to Business	Phase III (2016-2020) global Business	Progress To - date 2009*
Investment by Government and private sectors				
USD billion	1.7	2.6	4.3	1.3
RM billion	6.0	9.0	15.0	4.5
Total Employment	40,000	80,000	160,000	54,000**
Contribution to GDP (%)	2.5	4.0	5.0	2.0***

Note: Ratio of Government to private sector Investment is 70:30 (Phase I) and progressively moves to 30:70 ratio (Phase II)

Source:

(1) National Biotechnology Policy (2005)

(2) BiotechCorp

(3) JobStreet Malaysia

* Estimated for 2009

** Total employment figure covers the life science and biotechnology-related industry

***Estimated based on revised assumptions

Source: MBC Report 2009/2010, p.17.

Later, MBC decides to introduce BioNexus Status Malaysia. BioNexus status is a designation awarded to qualifying biotechnology firms, making them eligible for privileges contained within the BioNexus Bill of Guarantees (MBC, 2009), in which is summarized in Table 3.3.

Table 3.3 BioNexus Bill of Guarantees

1	Freedom of ownership
2	Freedom of source fund globally
3	Freedom to bring in knowledge workers
4	Eligibility for competitive incentives and other assistance
5	Eligibility to receive assistance for international accreditation and standards
6	Strong intellectual property (IP) regime
7	Access to supportive information network linking research centres of excellence
8	Access to shared laboratories and other related facilities
9	Biotechcorp as the one-stop agency

The introduction of Bill of Guarantees (Table 3.3) demonstrates Malaysian government's efforts to inculcate and nurture the biotechnology industry. These are done by addressing issues of freedom of ownership and establishing access to support information, network linking research centers of excellence. Hence, new business startups with BioNexus status are able to source financial assistance or funding globally without any restriction. The growth of BioNexus status companies has been very encouraging and from the initial total of 7 companies in 2006 it had reached to 126 companies in September 2009. The data suggest, agricultural biotechnology has seen a tremendous jump from only 1 company in 2006 to 55 companies in September 2009. This is evidenced in Table 3.4, Growth of BioNexus Status Companies in Malaysia from 2006 to 2009.

Table 3.4: Growth of BioNexus Status Companies in Malaysia (2006–2009)

Sectors	2006	2007	2008	Sept 2009	Compounded Annual Growth rate (CAGR) (%)
Agricultural Biotechnology	1	16	37	55	280
Healthcare Biotechnology	4	21	39	51	134
Industrial Biotechnology	2	5	16	20	115
Total	7	42	92	126*	162

Source: BiotechCorp

*As at 31 December 2009, the total number of BioNexus Status companies has increased to 151 companies

Table 3.5 reported in 2008 that the growth of BioNexus Companies was worth US\$108.2 million compared to only USD41.8 million from non-BioNexus Companies and this is a contribution of almost 70% to the total revenue of US\$150.1 million of the Malaysian biotechnology industry. Further to that, the report indicates that the creation of Bills of Guarantees for BioNexus status companies contributes positively towards the development of the biotech industry in Malaysia in terms of higher revenue contributions, and this may suggest the increasing number of jobs created for knowledge workers. Knowledge workers are defined as those involved directly and indirectly in the technical development and deployment of biotechnology products and services and they are equipped with tertiary education and/or industry experience (MBC, 2010).

Table 3.5: Revenue Contribution in the Malaysian Biotechnology Industry (2008)

Sectors	BioNexus		Non-BioNexus		Total Revenue		Percentage (%)
	USD Million	RM Million	USD Million	RM Million	USD Million	RM Million	
Agricultural Biotechnology	45.5	159.1	12.4	43.6	57.9	202.7	38.5
Healthcare Biotechnology	24.9	07.0	22.5	78.8	47.3	165.8	31.5
Industrial Biotechnology	37.9	132.9	6.9	24.3	44.8	156.9	30.0
Total	108.2	378.7	41.8	146.7	150.1	525.4	100.0

Source:

(1) BiotechCorp (as at 31 December 2008)

(2) SSM (as at 31 December 2008 or latest financial reports available)

Table 3.6 indicates that there has been an increase in the number of companies established, from 11 in 2007 to 13 in 2008, with a market revenue generation of RM2.4 billion. This is a jump of 9 per cent from 2007. Meanwhile, the total number of BioNexus Companies (companies with accredited status from MBC increased from 42 to 92 in 2008, a huge leap of 119 per cent. This translates to an increase of 1,851 knowledge workers in 2008 from a mere 384 in 2007, a 187 per cent increase.

Table 3.6: Public Listed Biotechnology and Life Sciences Companies and BioNexus Companies

Public listed Biotechnology & Life Science Companies	2008	2007	%Increase
Number of Companies	13	11	18%
Market Capitalisation	RM1.7 billion	RM2.5 billion	(32%)
Market Capitalisation versus total Bursa Malaysia Market Capitalisation	0.26%	0.23%	13%
Revenue Generation	RM2.4 billion	RM2.2 billion	9%

BioNexus Companies	2008	2007	%Increase
Number of Companies	92	42	119%
Public Companies	2	1	100%
Market Capitalisation	RM218.5 million	RM676.5 million	(68%)
Revenue Generation	RM378.6 million	RM131.8 million	187%
Knowledge Workers	1,851	384	382%
Investment	RM1.3 billion	RM1.1 billion	18%

Source : Annual Report 2008, MBC, p.6

Source: MBC Report 2007–2008, p.6.

3.4 BioNexus Status Companies and Knowledge Workers

MBC reports suggest (Table 3.7), that, of the 2,067 people employed directly by the BioNexus status companies up to September 2009, only 47.2 per cent were knowledge workers. What differentiates knowledge work from other forms of work is its primary task of “non-routine” problem solving that requires a combination of convergent, divergent, and creative thinking (Reinhardt et al., 2011). Mosco and McKercher (2007) outline various viewpoints on this matter. Despite various efforts done to bring in more knowledge workers especially in the area of biotech, the Malaysian Minister reported that around 304,358 Malaysians (including 50,000 students) left the country in 2007 by choice to work abroad and the most often quoted reason was the search for better education, career and business prospects (The Star Online, 2009). This statistic was alarming, where almost 304,358 of

these experts left for better opportunities. Ironically, it is estimated that a workforce of 100,000 knowledge workers will be required to support the biotechnology industry, which translates into 280,000 additional jobs supporting the industry by the year 2020 (MOSTI, 2008).

Table 3.7: Total Number of People Employed in the BioNexus Status Companies in Malaysia (2007–2009)

Sectors	2007		2008		Sept 2009	
	Total Employees	Knowledge workers	Total Employees	Knowledge workers	Total Employees	Knowledge workers
Agricultural Biotechnology	316	143	657	286	840	386
Healthcare Biotechnology	407	184	434	321	710	427
Industrial Biotechnology	217	57	354	101	517	162
Total	940	384	1445	708	2067	975

Source: BiotechCorp

Source: MBC Report, 2010.

The Malaysian government acknowledges the vital role that biotechnology entrepreneurs play in the biotechnology industry in Malaysia. Therefore, under the MBC, the Biotechnology Entrepreneur Development program was launched. This program is aimed at disseminating information on business opportunities for different types of funding sources and incentives for the biotechnology industry, where budding entrepreneurs could greatly benefit from through participation in business ventures (MBC, 2008). Through its Entrepreneur Development Unit, MBC has also created two significant programs for entrepreneurial development, namely the Biotechnology Entrepreneur Program and the BeST program (Biotechnology Entrepreneurship Special Training Program). The overall objective of the first program is to equip bio-entrepreneurs with appropriate skills and knowledge to commence, seek funding for and manage new entrepreneurial ventures (MBC, 2008). The second initiative is the Best Program. This is a 6-month fully funded intensive program aimed at Malaysian graduates who intend to join biotech and related industries. The Best Program is designed to enhance the participants' soft skills in communication, language and entrepreneurship awareness, and to determine participants' job suitability area (MBC, 2008). The training provided is intensive and fully structured, combining classroom training, classroom work and industry internship. Therefore, not only are participants equipped with

the theories, they are also exposed to the real life work situation during their internship with the hosting company (MBC, 2008). As at 31 December 2008, a total of 206 trainees had graduated from this program and 97% of them have secured employment in biotechnology and its related industries, whilst the remaining 3% have opted to further their education in a postgraduate program (Ibid). It is expected that these initiatives will create economic value for Malaysia and harness biodiversity, and they are built upon existing capabilities, especially through high-technology and knowledge-intensive activities (MOSTI, 2005).

Understanding the impact and value of the biotechnology industry to the country, the Malaysian government allocated almost RM2 billion in the Ninth Malaysia Plan to fuel various biotech related programs, including biotech commercialization and entrepreneurship development funds. The amount allocated by the Malaysian government (for biotechnology) in the 9th Malaysian Plan indicated a significant increase in budget expenditure from a mere RM574.4 million in the 8th Malaysian Plan. The Malaysian government is also showing that it is serious in promoting and creating a conducive, business-friendly environment for biotech entrepreneurs. This was proven when RM50 million was allocated for the Entrepreneurship Development Program in the 9th Malaysian Plan. As a comparison, no allocation was made for this program in the 8th Malaysian Plan, as shown in Table 3.8.

Table 3.8: Institutional Supports for Biotechnology Program

**DEVELOPMENT EXPENDITURE AND ALLOCATION FOR BIOTECHNOLOGY
2001 - 2010
(RM million)**

Programme	8MP Expenditure	9MP Allocation
Research and Development (R&D)	190.0	463.0
Biotechnology R&D Initiatives	190.0	363.0
Biotechnology Commercialisation Fund	-	100.0
Biotechnology Acquisition Programme	-	100.0
Biotechnology Business Development	216.8	529.8
Technology & IP Management	69.9	100.0
Entrepreneurship Development	-	50.0
Agro-biotechnology Projects	46.9	79.8
Institutional Support and Equity	100.0	300.0
Biotechnology Infrastructure	168.6	928.5
Total	574.4	2021.3

Source: Economic Planning Unit, Malaysia.

To facilitate the development of biotechnology in Malaysia, a specific policy has been developed by MBC and many new courses related to biotechnology have been introduced in

many local higher education institutions (MBC, 2008). Further, the creation of employment in the biotechnology industry is a positive phenomenon as it accelerates economic growth, increases job vacancies and reduces unemployment (MOSTI, 2005). Additionally, the Malaysian government utilizes tax effectively to create incentives in entrepreneurial value chain activities, including biotechnology. This is illustrated in Table 3.9.

Table 3.9: Malaysian Government's Tax Incentives for the Biotechnology Industry in Malaysia

No	Tax Element	The Benefit
1	Incentive for the holding company	Tax deductions for holding companies that fulfill certain conditions and investment in approved subsidiary biotechnology entities
2	Tax exemptions	Approved biotechnology companies will be eligible for pioneers status, which entitles them to 100% income tax exemptions for a period of up to 10 years. Specific biotechnology products are import duty and sales tax exempt.
3	Investment Tax Allowences	100% of qualifying investment over a period of 5 years can be set off against profits
4	Tax Exempt Dividends	Dividends issues by biotechnology companies to shareholders will be treated as tax exempt income
5	200% deduction on qualifying expenditure on R&D	The expenses related to pre-clinical and clinical testing, except for companies carrying out these activities for revenue generation

Therefore, it is seen that having an effective tax mechanism provides useful incentives to help and to build confidence among the business communities, researchers and investors in Malaysia. Furthermore, the Malaysian government has also re-positioned its role in the nation's technology and biotechnology initiatives by re-branding the Ministry of Science, Technology and Innovation as the Ministry of Energy and Green Technology, and this allows the Ministry to have regulatory powers and specific budgets to execute various activities planned for the industry. However, it is argued that regulatory efforts alone are not sufficient to move the industry forward, and thus it requires an active participation of new business venture creations to help to nurture spin-off companies.

3.5 The Rationale of Biotechnology as an Area of Focus

The importance of biotechnology as one of the engines of economic growth is eminent. Simon and Kotler (2003), for an example, conclude that one third of the world's Gross Domestic Product (GDP) is generated by biotechnology and related industries. The biotechnology sector also continues to grow by about 10 to 15 per cent globally, reaching

US\$271 billion in 2011 with the healthcare segment as the largest contributor to the overall biotechnology sector revenues (MBC, 2012). This suggests that the industry remains an important contributor to the economic growth of a country. The significant increase in the growth of this industry signals that it is not only big and multinational corporations that benefit from the industry but also small entrepreneurial firms. Malaysia, acknowledged that biotechnology is the engine of growth for life sciences in the 21st century (BIOTEK, 2001), by creating platforms for new products and markets on many fronts (Ernst & Young, 2000). Though still relatively new and limited in terms of scope, biotechnology has been recognized as one of the key drivers of Malaysia's economic future.

During the sixties, the economy of Malaysia encompassed mainly agricultural activities and commodities. However, today, Malaysia comfortably poised itself to become an export-driven nation, propelled by high technology, knowledge-based and capital-intensive industries. Malaysia has been ranked the fifth most competitive economy in Asia, following Singapore, Hong Kong, Taiwan and China, and the nineteenth worldwide (Schwab & Porter, 2008). Malaysia has gradually established and exploited the competitive advantages of the biotechnology industry. Five competitive advantages of biotechnology in Malaysia have been identified by Gomez (2005): Malaysia's rich diversity of flora, fauna and people; the already existing agriculture-based biotechnology; the increasing number of government grants and venture capital funding; the existence of an ICT infrastructure and experience in the high-technology industry; and the government's unrelenting commitment to biotechnology. Gomez (2005) further adds that Malaysia has around 4.06 million hectares of agricultural land distributed throughout its 14 states and approximately 75 per cent of this land is cultivated with primary crops such as palm oil, rubber, cocoa, coconut and pepper, while the remaining portion is dedicated to agro-food production. Malaysia has moved from an agriculture-based economy, with the agriculture sector as its main thrust during the early 1960s, to an industrial economy in the 2000s, with the manufacturing sector and service sectors as its main thrusts. Also, according to Gomez (2005), the real value of the agriculture sector had risen from RM33 billion in 2003 to RM40 billion in 2008, producing a total of 7258 agro business entrepreneurs. Another reason for biotech an area of research is the role biotech in transformation of agricultural activities and in addressing the long issues of sustainable food productions in Malaysia. The reason of Malaysia's venture in biotechnology is seen by legislators as one approach to capitalize on technology in increase agricultural production efficiency. This could suggest reducing the high food import bills that the country is facing. This is but one of the pressing issues that Malaysia has had to face, aside from sustainable food production and oil depletion. All of these influences have given birth to the introduction of biotechnology industry in Malaysia.

3.6 Conclusions

In short, Malaysian biotech depicts institutional intervention to shape biotech activities in Malaysia. In this context, policies and programs such as entrepreneurship development programs shape the industry in several ways and enables the individuals and stakeholders in the industry. Further, the creation of employment in the biotechnology industry is a positive phenomenon as it accelerates economic growth, increases job vacancies and reduces unemployment. The Malaysian government recognizes the importance of this industry by making intervention through policy and regulatory environments in developing the industry and ensuring public safety. Additionally, the analysis in this chapter demonstrates the importance of entrepreneurial facets in supporting institutional interventions towards generating opportunity driven activities in the biotech industry in Malaysia. To move forward, the analysis in this chapter posits to close the gap of needs between biotech policy makers and entrepreneurs in recognizing and creating business opportunities.

Shane (2012) views that we have a little more understanding of the process by which people exploit opportunities within existing organizations than we had a decade ago. We also have advanced very little in our knowledge of how entrepreneurs identify opportunities, formulate business ideas, and evaluate them (p. 14). Fletcher (2006) suggests that 'entrepreneurship is hardly a newly emerging field suffering from immaturity, adolescence and the 'liability of newness'. But when it comes to understandings of how and why business ideas 'locate' with particular individuals at particular points, she views that entrepreneurship is still fairly underdeveloped'. Theoretically, this chapter helps extend the scholarly examination of entrepreneurship researchers that view the domain of the entrepreneurship field as centering on opportunity recognition, evaluation, and exploitation (Aldrich & Ruef, 2006; Shane & Venkataraman, 2000; Venkataraman, 1997). Hence, the study of opportunity discovery and creation among biotech firms, help to re-shape the entrepreneurial opportunity discovery and creation constructs as a domain of entrepreneurship academic inquiry. This study aims to fill this gap.

Chapter Four

Methodology of Research and Research Design

4.0 Introduction

The aim of this chapter is to examine issues related to the research methodology and research design of this study. Research design involves a framework for the collection and analysis of data, and reflects decisions about the priority given to a range of dimensions of the research process (Bryman, 2008). Bryman further explains that a research method is simply a technique for collecting data and it can involve a specific instrument. This chapter investigates the methodological approaches chosen for the study and how the study is executed. This study draws on Weick's (1995 & 2001) conceptualization of sensemaking. Weick describes sensemaking as 'the concept well named because, literally, it means the making of sense. The conceptual framework developed in this study helps to examine the issue of entrepreneurial opportunity discovery/creation, thus addressing the main research question which is: How do entrepreneurs discover and create opportunities in the context of the biotechnology industry in Malaysia.

The first objective of this thesis is to examine the processes of entrepreneurial opportunity discovery and creation in Malaysia. This study examines how the individual, socio cultural and institutional supports forces shape the way entrepreneurs discover and enact opportunities. The second objective is to identify relevant factors that influence entrepreneurs into opportunity driven activities. This is to gain a more advanced understanding of why and how entrepreneurs discover and create opportunities. Thirdly, an additional objective is to explore the implications of this study, particularly in the biotech industry in guiding the entrepreneurs to promote better and effective entrepreneurial initiatives for them. In the context of this chapter, the use of multiple approaches in data collection and analysis processes (i.e. Interviews, personal observations and an interpretative analysis) enriches the study of entrepreneurship and generally allows better understanding of the current issues being researched. To understand the research methodology better, this chapter starts by examining the methodological considerations.

4.1 Methodological Considerations

As Crotty (1998) explains, methodological considerations have the ultimate purpose of providing the researcher with scaffolding, or a path they can follow, which coincides with

their particular research purposes. This includes beliefs about the nature of reality (ontology) and beliefs about how knowledge is acquired (epistemology) combined with the nature of how methods are used or studied (methodology) (Guba & Lincoln, 1994). Once researchers have developed a research question they are seeking to answer, they must consider what methodologies and methods they will employ in the research; what theoretical perspective lies behind the methodology; and what epistemology informs this theoretical perspective (Crotty, 1998). Therefore, identifying the methodological consideration that explains the research assumptions is crucial to this study. This chapter explains the methodology that depicts the theory of knowledge, reality and inquiry and all the assumptions connected with each idea. The aim is to understand the subjective nature of 'lived experience' from the perspective of those who experience it [the entrepreneurs], by exploring the subjective meanings and explanations that individuals attribute to their experiences. Patton (1990) defines such a phenomenological focus quite simply as describing what people experience and how it is that they experience what they experience'. The methodological implication of this focus on living experience is that an individual's interpretation of the experience is an essential part of the experience itself (p. 71).

Thomson et al. (1989) argue that the world of 'lived experience' does not always correspond to the world of objective description, because objectivity often implies trying to explain an event or experience as separate from its contextual setting. Recognizing and appreciating the research aim – to understand the phenomena of entrepreneurial opportunity among biotech entrepreneurs in Malaysia – a qualitative methodology appears to cohere with this. Through the qualitative research method, this study was able to answer the questions about why and how biotechnology entrepreneurs are affected by constructing events that go on around them. The importance of utilizing this research method within the entrepreneurship domain is reinforced by Gartner and Birley (2002:387): 'It is our opinion that many substantive issues in entrepreneurship are rarely addressed, and that many of the important questions in entrepreneurship can only be asked through qualitative methods.' In addressing the issue of opportunity discovery and creation, this thesis uses case study a tool to operationalize the research. This research technique was selected as it is useful for examining an experience in its natural settings (Benbasat, 1984) in the area entrepreneurship in biotechnology. Yin (1989) recommends case studies when a researcher aims to expand and generalize theories (analytic generalization) and not to specify frequencies (statistical generalization). Additionally, to address the shortcomings of case study that limit their usefulness in understanding an entrepreneur's action and events, a proper methodology has to be chosen and appropriate tools for data collection and analysis have to be selected. This is to guide the researcher and to develop a high quality case

study. There are two steps in developing a high quality case study (Yin, 2003). Firstly, it must articulate theory about what is being studied to help operationalized case study designs and make them more explicit.

A theory is “an ordered set of assertions about a generic behavior or structure assumed to hold throughout a significantly broader range of specific instances” (Weick, 1989, p. 517, citing Sutherland, 1975, p. 9). All “good” or effective theory is driven by logic (Wacker, 2004). Developing from a base of logic, theory explicates the how, why, and when of relationships existing within a system of constructs and variables (Bacharach, 1989; Weick, 1989; Whetten, 1989). The theory explains the causal links between one set of phenomena and at least another set of phenomena (Blalock, 1979). Strong theory not only identifies causal relationships but also the magnitude of these relationships (Ireland et al, 2005). There are opportunities to develop theoretical frameworks that are unique to the entrepreneurship field (p. 121). However, the fragmented nature and diverse scope of previous entrepreneurship research (Gartner, 2001; Shane & Venkataraman, 2000) suggests that efforts to do this will be complex and difficult (Amit, Glosten & Muller, 1993). This complexity and difficulty calls for scholars to initially focus on integrating specific concepts of the entrepreneurial process to establish a common framework from which future theoretical contributions can be derived.

Shane and Venkataraman (2000) suggest two possible options for theory development in terms of entrepreneurship: (1) entrepreneurs and (2) entrepreneurial opportunities and the processes of recognizing and exploiting them in which this thesis is focusing. Secondly, case study needs to maximize four conditions related to design quality which is a construct validity, internal validity, external validity and reliability (Yin, 2003). This includes establishing credibility through trustworthiness. As posited by Lincoln and Guba (1985), trustworthiness encompasses establishing credibility which makes up the confidence in the ‘truth’ of the findings, and they suggested that trustworthiness is important in evaluating the worth of a research study. Trustworthiness, according to Lincoln and Guba, includes three important components, which are transferable, dependability and confirmability. Transferability is showing that the findings have applicability in other contexts while dependability involves showing that the findings are consistent and could be repeated. Finally, confirmability is a degree of neutrality or the extent to which the findings of a study are shaped by the respondents and not researcher bias, motivation, or interest.

4.1.1 Transferability

Transferability is an important component of trustworthiness. The naturalistic paradigm of transferability depends on the degree of similarity between the original situation and the situation to which it is transferred (Douglas, 2004). However, in terms of findings, transferability cannot be specified; instead, the researcher can only provide sufficient information that can then be used by the reader to determine whether the findings are applicable to the new situation (Lincoln & Guba, 1985). This is referred to as naturalistic generalization (Stake, 1978) or extrapolation (Patton, 1990). Naturally, the wider the theoretical sampling is developed, the more embedded is the theory that is established. Additionally, generalisability in the natural world enterprise requires general theories that can emerge from within the quantitative paradigm (Douglas, 2004). Generalisability does not depend on sampling criteria; it depends on substantive data (Patton, 1990). Consequently, the product of qualitative inquiry does not need to be a theory or model to be applied to a large number of diverse situations.

4.1.2 Credibility

To understand qualitative research, the issue of credibility needs to be addressed. Credibility does not depend much on the sample size; rather it depends more on the richness of the information gathered and on the analytical abilities of the researcher (Douglas, 2004). Several techniques can be used to establish credibility, such as prolonged engagement, persistent observation and triangulation (Lincoln & Guba, 1985). However, for the purpose of the thesis, I am focusing on method triangulation and cross case analysis techniques. There are four types of triangulation identified by Patton (1990) – methods triangulation, data triangulation, triangulation through multiple analyses, and theory triangulation. Among these types, data triangulation can enhance research credibility. Building on the work of Patton, this study utilizes methods triangulation through the use of four research instruments, namely the interpretive, the interview, the in-depth interview and personal observations approaches as the data collection process.

4.1.3 Validity

There has been increasing concern about the issue of validity in qualitative research (see e.g. Reason & Bradbury, 2001b; Seale, 1999) as well as in other fields such as action research (Reason & Bradbury, 2001b), discourse or conversational analysis (Seale, 1999), psychology (Kvale, 1995), and social science and applied fields including education

(Eisenhart & Howe, 1992). In fact, the issue of validity has been addressed for more than half a century (Atkinson et al., 2003). Validity in qualitative research involves determining the degree to which researchers' claims about knowledge correspond to the reality (or respondents' construction of reality) being studied (Eisner & Peshkin, 1990). Additionally, there are various issues and arguments pertaining to whether there is validity in qualitative research and how these issues are addressed by the researcher. According to Lincoln and Guba (1985), validity is the degree to which a researcher can demonstrate the neutrality of the researcher's interpretations, through a confirmability audit, one of the techniques for establishing confirmability in research. On the other hand, Johnson et al. (2006) suggest the use of an ecological audit of the researcher's knowledge claims, going back to the raw data (interview notes, tape recordings, observation notes, etc.) and analysis notes, reconstruction and synthesis methods, process notes, personal notes and memoranda. This process is also known as an 'audit trail'. As explained by Cohen and Crabtree (2006): 'An audit trail is a transparent description of the research steps taken from the start of a research project in the development and reporting of the findings. These are records that are kept regarding what was done during an investigation.' (p. 1). In the context of this thesis, an audit trail presents a visible and transparent description of the research steps taken from the start of the project including to the development and reporting of the findings throughout the research processes. To ensuring neutrality of the interpretation in the analysis of data, the researcher demonstrates an audit trail in its methodological process.

4.2 Audit Trail

An audit trail was first promoted by Halpern (1983) in which the first process includes keeping in a safe place the raw data such as written field notes and unobtrusive measures (documents). The second stage involves the process of data reduction and analysis, including summaries such as condensed notes, unitised information and quantitative summaries and theoretical notes. These materials include the recording of the process of adding and eliminating research processes and theoretical notes. The third stage of the research audit trail is data reconstruction and synthesis products, including the structure of categories (themes, definitions and relationships), findings and conclusions, and a final report including connections to existing literatures and an integration of ideas, relationships and interpretations. The last stage is managing materials relating to intentions and dispositions, including the inquiry proposal, personal notes (reflexive notes and motivations) and expectations (predictions and intentions), instrument development information including pilot forms, preliminary schedules, and observation formats. These steps may not be sufficient to be claimed as comprehensive, but they eventually help to facilitate and to build

trustworthiness in the methodological process of the study. Concerning this, all relevant raw data including audio interviews, data reduction and analysis products are to be kept and documented systematically, and this includes the interview questions from the exploratory study, the interview schedules for the selected biotechnology entrepreneurs and the observation notes. In the context of this thesis, the role of the inquirer (the researcher) is iterative, while abductive approach complements the aim of the research capture meaning and actions of the respondents.

4.3 Abductive Approach

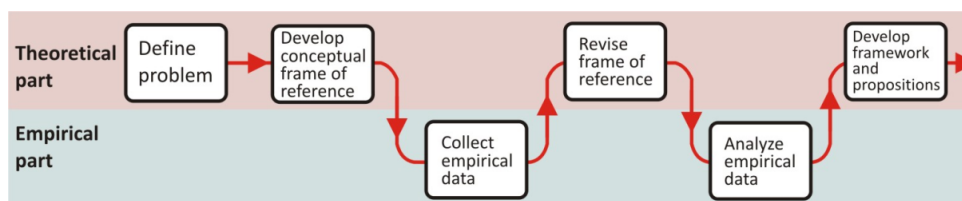
The abductive approach is a term used to describe a form of inquiry that is separated from both induction and deduction (Forstater, 1999c). Peirce considered that the function and purpose of retroduction/abduction lie in explaining “some surprising phenomenon, some experience which either disappoints an expectation, or breaks in upon some habit of expectation of the inquisiturus” (Peirce, 1966:367). Peirce’s vision of abduction as a form of disciplined, targeted conjecture following a surprising observation is equally capable of applying to both positivist and interpretive research (Chamberlain, 2006). However, Blaike has described a uniquely interpretive version of abduction, which discourages the imposition of a specific frame of reference onto the research subjects (Blaike, 2000). Chamberlain (2006) summarizes Blaike’s conception of an abductive research strategy that consists of two parts. This is explained below:

‘First, the methodology adopts an interpretivist ontology, that is, social science is approached from the viewpoint of the participants, perceive it as being. Second, the research project is addressed by the researcher becoming sufficiently engaged, even immersed, in the interpretivist reality of the situation to perceive whatever is remarkable or noteworthy, and then insightfully speculate on likely associations or causations of it.’ (Chamberlain, 2006, p.295)

This thesis adheres to the conception of abductive reasoning, while making selective use of both Blumer’s visions of ‘sensitizing ideas’ (Blumer, 1954) and Blaikie’s version of interpretive abduction. This process involves identifying the specific area(s) where a lack of clear conceptual basis is likely to render the data generation task nearly meaningless, then applying externally derived theory minimally and in those areas only, as a ‘sensitizing idea’ (Chamberlain, 2006). Nevertheless, this study employs imported ideas of sensemaking together with the idea of discovery and creationist views of entrepreneurial opportunity to address the issues identified in the research questions. The aptness of the imported idea, as described by Chamberlain, is then tested in the research situation by examining the consistency, coherence and plausibility of its effect on the raw observations of the behavioral

process of opportunity creation by entrepreneurs using biotechnology means. The process of the abductive approach used in this research is summarised in Diagram 4.1 below.

Diagram 4.1: Abductive Approach



The abductive approach of this research comprises two parallel processes of the theoretical and the empirical parts. It starts by defining the research problem and finishes at the development of the framework and key themes stage. This approach involves combining both the activities of mapping the concepts from different literatures and testing them during the field work study. Qualitative research reports are typically rich with detail and insights into the participants' experiences of the world. One important element that helps explain, define and measure the insights into participants' experiences is the unit of analysis.

4.4 Units of Analysis

In studying human relations within an enterprise, the unit of analysis can be highly complex: it is not necessarily the enterprise itself as an entity, nor is it necessarily the individual actors as separate units of analysis, including the entrepreneur (Douglas, 2004). The unit of analysis refers to the basic unit of text to be categorized during the process of content analysis. Messages have to be unitised before they can be coded, and differences in the unit definition can affect coding decisions as well as the comparability of outcomes with other similar studies (De Wever et al., 2006). Therefore, defining the coding unit is one of the most fundamental and important decisions (Weber, 1990). Qualitative content analysis commonly employs individual themes as the unit for analysis, rather than the physical linguistic units most often seen in quantitative content analysis. For example, a theme or idea might be demonstrated in a single word, a phrase, a sentence, a paragraph, or an entire document. When using them as the coding unit, one primarily looking for the expressions of an idea (Minichiello et al., 1990). The unit of analysis for this study is defined as the process in which biotech entrepreneurs recognize and create opportunities.

4.5 Research Design

Research methodologists suggest that there is no definite right or wrong approach for any one research task (Bryman, 2004; Yin 2009) What is important is for the researchers to adopt an approach that would best provide them with answers to their research questions and/or issues under investigation (Gerson & Horowitz, 2002). This is especially significant given the fact that my research question is interdisciplinary in nature as the study seeks out to explore a phenomena that is affected by namely individual, institutional supports and social influences. To achieve the aims of the research, a plan in the form of research design is essential. This provides a logical sequence of operating plan and a guidance to the researcher. While, research design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions (Yin, 2009). Yin explains this further:

'A research design is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions. Between "here" and "there" may be found a number of major steps, including the collection and analysis of relevant data.'

(Yin, p. 26)

Following Yin's suggestion, this thesis outlines its research design steps or stages. These steps are summarized here, and discussed in detail the next sub-chapters. Identification and formulation of the issue is an important and crucial part that drives this study forward. At this stage, issues are identified and selected based using several means including, researcher's personal working experience, personal conversations and interactions with people involves in biotech business as well the past studies done by scholars and industry experts. The next stage of research design is reading, synthesizing and identifying further relevant issues available and research by other scholars in relevant areas of entrepreneurship and biotechnology. Consequently, this is a non-linear process evolving the researcher to go back and forth to corroborate the issues from different sources identified in one strong case that demonstrate the research question for this thesis. While, this process could further benefit by understanding current issues emerging from the subject, the biotechnology industry in Malaysia, while an exploratory study of biotechnology entrepreneurs was investigated. At this stage, the aim is to capture and corroborate the actual issues exists in biotechnology industry in Malaysia with the past literatures issues. Additionally, two biotech companies were interviewed for this purpose. The exploratory study and the literature reviews enhance the formulation process of the key issues of the study thus four key themes of sources or

opportunity, entrepreneurship discovery and creation, collaboration and business networking. The next stage is the data collection activities (fieldwork) and this includes interviewing nine carefully selected biotech entrepreneurs. This study uses qualitative methodology. This involves conducting interviews and in-depth interviews and using participants' personal observations. The second stage of data gathering activities was an in-depth interview with three of the nine biotech entrepreneurs from the three different categories. This process begins with the identification of contacts that offers access to suitable and resourceful respondents. This involved making phone calls and emailing social contacts such as business colleagues and personal friends. The researcher's personal background in this sector helped facilitate this process. The process of arranging interviews ran parallel with that of getting informed consent. Interviews were arranged with the respondents via emails and phone calls from the UK. The rationale behind the selection process of the entrepreneurs is explained in the later part in this chapter.

The following step in the data collection includes a personal observation of a business meeting between some entrepreneurs and their potential clients from Vietnam, with both note taking and digital audio recording approaches. The final step of the research design covers the data analysis, interpretation, discussions and conclusions. Interview data are analyzed and interpreted accordingly. Consequently, the data analysis step covers the creation of coding items, identification of key research themes, translating and transcribing of interview data. This was the most time consuming stage that requires commendable resources particularly during the process of listening to audio interviews, translating and the same time transcribing the interviews. A case study strategy has been employed in this study and Yin (2003) suggests that qualitative data are a type of evidence, where interviews and ethnographic are data collection methods, and case study is a type of research strategy. The research design, with the step-by-step research strategy can better explain the research process of the entrepreneurial phenomenon shaping the biotechnology industry.

4.5.1 Step 1: Obtaining Informed Consent

Many researchers agree that because qualitative research is conducted in an ever-changing field, informed consent should be an ongoing process. Seymour and Ingleton (1999) highlighted that entry into the field of research involves two separate phases. The first is negotiation with the respondents about the nature of the fieldwork to be done and the second is the manner in which informed consent is gained from respondents. Hence, the entry stage negotiation and obtaining consent are crucial. All nine entrepreneurs accepted the request for an interview and agreed that the materials gathered during the research

process could then be used for the research purposes. The nine entrepreneurs/cases are Innobiologics, Alor Gajah Garden Product, Invitro Tech, Asma Agro, Power Biotechnologies, Brass Bakti, Orchid Life, Farmina Biopharmaceutial and Wafergen Biosystems. A consent letter was obtained from the University of Sheffield in the field works research done in Malaysia and sent via email to all nine respondents.

4.5.2 Step 2: The Exploratory Study

The exploratory study took place between 15 August and 25 September 2009 in Malaysia. The interview schedule was piloted in two biotechnology companies; Innobiologics and Brass Bakti in Malaysia to ensure its reliability and appropriateness for the study. Bryman (2001) suggests that piloting helps to ensure that the interview questions operate well and the research instrument as a whole function well. In this study, the interview schedule was pilot tested in two phases. The interview questions were first piloted on the PhD supervisors and then later on colleagues who are doctoral students in management to ensure that all questions were completely and clearly covered and to avoid redundancy of questions. During the pilot study, two doctoral students in management who had experience of working in business and entrepreneurial ventures were very helpful in reviewing the interview questions and the interview schedule. The interview questions were reviewed for syntax, spelling, integration, comprehensibility and grammar. This was to avoid confusion, slang, abbreviations, ambiguity and vagueness. This review also ensured that the intended respondents would readily find the questions understandable. Bryman (2001) argues that pilot testing is best conducted on a small set of respondents similar to those in the final survey. The interviews were undertaken between 15 August and 25 September 2009 with two biotech firms very similar to those in the study's sample frame. Two CEOs from two firms were interviewed and each interview lasted for almost an hour. The scope of the interviews included the background of the companies and the nature of the business. The elements addressed during the interviews were the background of the business, business activities and other issues relevant to how entrepreneurs utilize their resources to exploit profit opportunities. Data from the exploratory study relevant to the conceptual frameworks were then analyzed. Based on the literature reviews and the secondary data of the study, it appears that only a few issues that emerged from the interviews gave deeper meaning in addressing the aims of the study. Initially, the researcher started by conducting informal discussions and these discussions allowed the researcher to gather valuable information on the background and aspirations of the bio-entrepreneurs.

4.5.3 Step 3: The Field Work Interviews

In interviews the respondents were encouraged and given an opportunity to explain in detail their feelings, experiences and opinions on the specified issues resulting in rich data resources to work with (Rubin & Rubin, 2005). The interviews were also used to elicit complex and obscure information from the respondents such as their meaning and interpretation of entrepreneurship, governmental influences and social and cultural values, something that might not be possible under the survey method (Williams, 2002). In short, a qualitative interview has been a conversation often between two persons, the interviewer and the interviewee (Kvale, 1996). Unlike ordinary conversation the qualitative interview is more focused, more in-depth and more detailed (Rubin & Rubin, 2005). The main purpose of qualitative interviews is to generate depth of understanding rather than breadth (Rubin & Rubin, 2005). The interview respondents in this study were identified through three different means: (1) identified by the researcher (2) introduced by key informants and (3) snowballing that is one respondent leading me to other respondents. In all of the cases, the suitability of the interviewees in this study was determined mainly on the basis of their ability to provide data or information relevant to the research questions of this study and their ability to contribute further to proffered explanation (proposition/research question) that the study is developing (Mason, 1996). Acknowledging the nature and busy schedule of my respondents, all interviews were undertaken at places and time that were more convenient to the interviewees according to their request. Most of the interviews were undertaken between the interviewer and the interviewee.

The respondents include entrepreneurs from three different areas of the biotechnology industry: government funded entrepreneurs, personally funded entrepreneurs and family business funded entrepreneurs. The three categories were chosen in order to allow the researcher to examine the key themes of opportunity discovery and opportunity creation from three different contexts. These interviews were complemented by an in-depth interview and a personal observation to biotech entrepreneurs. The combination of the interviews with the in-depth interviews and personal observation was determined as beneficial and insightful for the purpose of this study. The following step is the first stage data collection activities (fieldwork) and this includes interviewing nine carefully selected biotech entrepreneurs from three different categories, namely government funded entrepreneurs, personally funded entrepreneurs and family funded entrepreneurs. The rationale for this choice is to identify different patterns emerging from different categories of entrepreneurs. In choosing the participants for this study, 'purposeful' sampling was used, as described by Patton (1990).

‘The logic and power of purposeful sampling lie in the selecting of information-rich cases for study in depth. Information-rich cases are those from which we can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling.’ (Patton, 1990:169)

All respondents were purposefully sampled according to three categories: government funded entrepreneurs, personally funded entrepreneurs and family funded entrepreneurs. For the purpose of case selection, the researcher adopts the ‘snowball or chain sampling’, which identifies cases from people who know people who know what cases are information-rich, that is, good examples for study or good interview subjects (Patton, 1990:182). There are both potential advantage and disadvantage of this sampling approach. One potential advantage it is possible to include members of groups where no lists or identifiable clusters even exist (Black, 1999). However, in the context of this thesis, this was not the issue. Six respondents were recommended by the governing body of the biotechnology industry in Malaysia, the Malaysian MBC, from their official lists, before the interview sessions while the other three respondents were chosen from personal business and social networks from the biotechnology industry in Malaysia. Using contacts from industry, academia and friends can be helpful, initially in establishing what the *population* is of organizations one might draw the case study from, and then for how to choose the case(s) (Hartley, 1994). While, Black (1999) argues that the disadvantage of snowball sampling is no way of knowing whether the sample is representative of the population.

In the context of this study, I would prepare a set of interview questions on the issues that needed to be covered. I would usually start off the interview by introducing myself and the aim of my research before one common question such as how the entrepreneurs started to get involved in their business or what drives them into business activities. Other issues discussed during this interview included in-house designed and developed technologies and contracted out technologies, and how these affected their businesses. There were also questions on the impact of the media on entrepreneurs, and how the media facilitate and affect the biotech industry in Malaysia. The other issues discussed were, the importance and roles of institutional supports in the process of opportunity creation, specifically the role of entrepreneur–government collaborations, government policy towards biotechnology entrepreneurs, the creation of relevant educational infrastructures in the area of biotechnology sectors, and financial assistance and funding. During this stage of study, the researcher investigates the elements of business networks, focusing on the effects of personal and formal networks on entrepreneurs. The data obtained during this stage and the existing literatures were used as to develop the interview questions for the first stage data collection process.

4.5.4 Step 4: Considering Ethical Issues

In the next step, the interview questions were first sent by email with a covering memorandum. The memorandum and the introduction to the interview both assured participants that their responses would be treated in strict confidence and their identity would never be linked to their responses, and that no personal details would be made public. This study involved human interaction and participation. Consequently, critical attention was given to ethical considerations in order to ensure that the study conforms to ethical principles and values governing research involving humans as well as to protect both the respondents and researcher (Habibis, 2006). An ethical approval was submitted and accepted by the Ethics Committee of Management School, University of Sheffield. Another critical consideration for ethical research is on how the data and information gathered from the research would be shared and stored (Creswell, 2003). For this study, records including interview transcripts in both languages, Malay and English were only shared with the researcher with her supervisor. Completed interviews data are kept in a safe place and once the research is completed they will be destroyed.

4.5.5 Step 5: Data Collections

Data is collected primarily by fieldwork, but secondary data collection is usually employed as well. The first stage of the data collection process demonstrates that the researcher engages in the field work of all nine entrepreneurs. The first phase of fieldwork took place from 17 January to 3 April 2010 in various states in Malaysia. The task of data gathering was carried out at nine entrepreneurs/cases namely Innobiologics, Alor Gajah Garden Product, Invitro Tech, Asma Agro, Power Biotechnologies, Brass Bakti, Orchid Life, Farmina Biopharmaceutial and Wafergen Biosystems operating in the biotechnology sector in Malaysia. A letter of intent was sent to all respondents in early January 2010. A letter of intent to conduct field works in Malaysia has been supplied by the Management School, University of Sheffield dated 5th January 2010 (please refer to Appendix B: Introduction Letter for Field Work Interview Activity in Malaysia). A phone call and email were also initiated to obtain consent at the date and time of interviews.

The most critical part of the data gathering process was the interview. Research methodologists (Bryman 2001; Kumar 2005; Leedy and Ormrod 2005; Yin 2003) describe the interview as a superior data gathering device, because people are more willing to talk than to write. Kumar (2005) claims that if a question is misunderstood the interviewer can either repeat it or put it in a form that is understood by the respondent. Furthermore,

conducting an interview allows the interviewer to have access to the respondent's gestures and tone of voice, and to the emotional influence the response. Hence, the words and tone of voice can be protected, recorded and later recalled using the latest technology currently available in the market. Moreover, the interview method provides an opportunity to penetrate in-depth the responses of the interviewees, something unlikely to be achieved through other investigative means (Leedy and Ormrod, 2005). Because the objects of inquiry in the interview are humans, extreme care must be taken to avoid any harm to them (Fontana & Frey, 2005). To address this issue and to increase the reliability of the interview process, a case study protocol was developed. As Yin suggests (2009), a case study protocol is a major way of increasing the reliability of case study research and is intended to guide the investigator in carrying out the data collection from a single case study (even if the single case study is one of several in a multi-case study). The researcher conducted all the prearranged interviews and they took place at predetermined locations at the entrepreneurs' offices throughout Malaysia. Each interview session took approximately 1-2 hours of interview time per research participant and this did not include the time for factory visits. The movements of the visits were captured using a Canon DSLR camera while all the interviews were digitally recorded using an Olympus VN-5500PC digital recorder. Field notes were also taken where possible. All the interview data, including the secondary data provided by the respondents, were brought back to Sheffield, UK, for analysis. The first stage interview data analysis was done between May and July 2010.

In the context of this study, an in-depth case analysis was conducted on three of the entrepreneurs operating in the biotech industry in Malaysia. The in-depth interviews involved three carefully selected entrepreneurs chosen from all three categories: government funded, personally funded and family funded entrepreneurs. The respondents were selected from the nine entrepreneurs of the earlier first stage interview process. They were selected based on certain identified characteristics that enabled the researcher to analyze more deeply the phenomena of opportunity discovery and opportunity creation. Additionally, the selection of the cases provides more in depth understanding of the investigated area of entrepreneurship discovery and creation. They also help to confirm sensemaking more than other cases. The two characteristics of case selection are firstly, agreement by and access to the respondent's participants, and secondly, data collection and the nature of active and long involvement in entrepreneurial activities such as business involvement, prior knowledge and career experience and the maintaining of active social and institutional relationships. The interviews were conducted from the 3rd October to 5th November 2010 in Malaysia for approximately one month. The researcher was also able to gain approval from one case, Power Biotechnology to conduct a participant observation. The researcher was invited by

two entrepreneurs from the Power Biotech company, on 29th September 2010, for an observation of business discussions in a pre-arranged meeting. The meeting was conducted in a very friendly environment at his office in Malaysia and the potential client, from Vietnam, was known to them. The purpose of the meeting was to introduce the potential clients to their market offer and to show how they, the entrepreneur, could add value to the business relationship. From the Vietnamese side, there were three of them and only one person was able to communicate in English: he was introduced as the consultant for the Vietnamese entrepreneurs. I asked the entrepreneur not to introduce me as a researcher so that I would be able to observe the discussion process in a more natural way. I was observing, taking pictures and notes, and video recording some of the activities during the meeting. I managed to record a few conversations between the potential clients (the Vietnamese entrepreneurs and the consultant) and the entrepreneurs during the meeting.

The process of personal observation helped me to understand better why and how people communicate their ideas, and how these ideas are being translated into profit opportunities. My participation in the meeting facilitated me to gather valuable messages and actions presented from both the entrepreneurs and the potential clients. The Vietnamese clients formed an important part of the whole process of Power Biotechnology business ambition to gain access to the biotech market in Vietnam. The selection of the Vietnamese clients was proposed by the Power Biotechnology on the premise for me to observe the process on why and how people in this case, the entrepreneurs and the client interacts. The purpose of the interactions was to demonstrate Power Biotechnology's capability to address the issue of waste treatment in Vietnam. In this context, it was crucial for Power Biotechnology to present sensible ideas to convince their clients that their proposal suits the needs and the requirements of Vietnam. In the context of the data collection, the use of interview and research participant's and the client's observations enriches the whole data gathering process. Additionally, qualitative interviewing continued to be practiced hand in hand with participant observation methods (Fontana and Frey, 2005). This chapter proceeds by investigating the data analysis and the interpretive approach applicable as an approach used in the thesis.

4.6 Data Analysis & Interpretive Approach

This study uses an interpretive inquiry approach and three key areas in analyzing and interpreting the data, following the method suggested by Limb and Dwyer (2001) and Rogers and Viles (2003). Unlike the naturalist's methodology, an interpretivist does not explain or anticipate; rather, the key is to understand (*verstehen*). As a method, understanding must

begin from the preconception that there is at least some common ground between the researcher and the researched. In addition, an interpretivist has different suppositions in terms of world perceptions where in social phenomena the world is seen to have different meanings. To an interpretivist, one factor affects the change in the social context. Due to this, different studies may lead to different conclusions for one observation. Additionally, the epistemology in the interpretive approach stems from investigations of various phenomena and this distinguishes the social context from natural science. Hence, an ontological assumption concerns the nature of the world and human beings in social contexts (Bryman, 2001). A well-established interpretive tradition exists within the social sciences; however, it is only in recent years that interpretive research in entrepreneurship has emerged (see, for example, Bouchikhi, 1993; Chell & Pittaway, 1998; Costello, 1996; Hines & Thorpe, 1995; Johansson, 1995; Rae, 2000; Rae & Creswell, 2000; Steyaert, 1997). As illustrated by Grant and Perrin (2002), small business and entrepreneurship research remains dominated by Objectivist and functionalist approaches while the interpretive methodological assumption focuses on analysis of the methods used for gaining the data, and uses observation and fieldwork notes to investigate the research object. This indicates that the interpretive paradigm is inclined towards using qualitative methods for observation, and thus the findings can be open to different forms of interpretation.

In the interpretive approach, entrepreneurship is viewed as a process of sensemaking, in which new ideas and possibilities become enacted, selected and legitimated until they are finally accepted by potential users. Inspired by Weick (1995) and Gadamer (1994), the interpretive approach to entrepreneurship study has been followed by many researchers including Lavoie (1991), Gartner (1993) and Bjerke (2007), and the key assumptions are that entrepreneurship should be understood by studying culturally embedded participants while stressing theoretical holism. In view of this notion, the researcher is placing a strong emphasis on the role of cultural norms among the entrepreneurs who are the respondents, such as the beliefs embedded within their self that affect the way they act and behave. This phenomenon has actually sparked discussions on the idea of 'enactment', which literally translates as 'the process of acting something out' in entrepreneurship. Enactment theories of entrepreneurship perceive the process of creation as the formation of new organizations/entities/groups/companies (Gartner, 1993; Gartner et al., 2003). Gartner (1993) further suggests that enactment is vital if we want to cancel out the standard understanding of entrepreneurship, in which opportunities are seen as something that is always 'right under our nose' – easily noticed and found. The opportunity enactment perspective is focused on sensemaking, stressing that reality is socially constructed through actions which bracket 'a cacophony of experiences and opportunities that entrepreneurs are

engaged in' (Gartner et al., 2003). Regardless, empirical studies applying the process understanding of opportunity recognition are still quite rare (Fletcher, 2006), making it beneficial to conduct empirical investigation on this particular issue. Generally, interpretive inquiry aims to characterize how people experience the world, the ways they interact together, and the settings in which these interactions take place (Parker, 2008). This involves the interpretation of meaningful human expressions, be they written, verbal and/or physical, involving namely human and social actions, in this thesis, demonstrated by entrepreneurs. Smith (1992) argues that human actions are those assertions people make based on reasons, intentions and motivations, while the idea of social must be added because the meanings ascribed to human actions, both by the actors and the interpreters, are determined by, and can only be understood within, a social meaning. The advantage of interpretive inquiry is it viewed the role of the researcher as inquirers and it carries an active role. Inquirers are also interpreters of the interpretations. People give meaning to their own actions and to the actions of others, and thus what inquirers are concerned with is no different from what most people are concerned with – understanding (Smith, 1992). An interpretive approach involves interpreting symbolic forms, narrative, arguments, conversation and the setting of the research context – in this case, biotech entrepreneurs. The analysis process begins with reading (for data immersion) and rereading all nine cases from both the first stage interviews and the in-depth interviews that were carried out. In choosing these nine cases in this study, 'purposeful' sampling was used, as described by Patton (1990). The analysis starts with the reading process, involving familiarity with the story, terms, languages and ideas discussed during the interviews. The reading of content is also used to identify emergent themes within the biotechnology industry in Malaysia and to develop general explanations. The data immersion process also involves identifying patterns or themes and examining how these occur.

The researcher uses pre-set themes which were first identified and coded based on the literature reviews, and key emerging themes/patterns from the data. The researcher identified whether the themes occur in all or only some of the data, observing the relationships between various themes and observing the contradictory responses based on the pre-set interview questions on the themes. The three key areas that represent the pre-set themes for this thesis are the sources of entrepreneurial opportunity, views on entrepreneurial opportunity discovery and creation, and opportunity exploitation. The identified themes enact the structure and context of the research investigation. Before identifying the key themes and the emerging themes from the data, the coding process is developed. Accordingly, the study advanced to the integral part of the data analysis which is the coding process, defined by Green as "the process by which data extracts are labelled as

indicators of a concept” (2005, p. 75). To begin with the coding process I carefully re-read my transcribed and translated interviews, in order to locate the relevant segments of data or quotations, with their respective coding tags and comments transferred to separate files (i.e. The interview key themes). In coming up with the appropriate coding for the data, I carefully selected a combination of “a priori codes’ and ‘inductive codes’ as suggested by Willis (2006, p. 266). Table 4.1 demonstrates the coding and schematic description of the three components; namely, the individual forces, institutional forces and the sociocultural forces emerging from the key themes in the biotech industry in Malaysia. The coding system aims to facilitate the process of the research investigations.

Table 4.1: Coding and Schematic Description

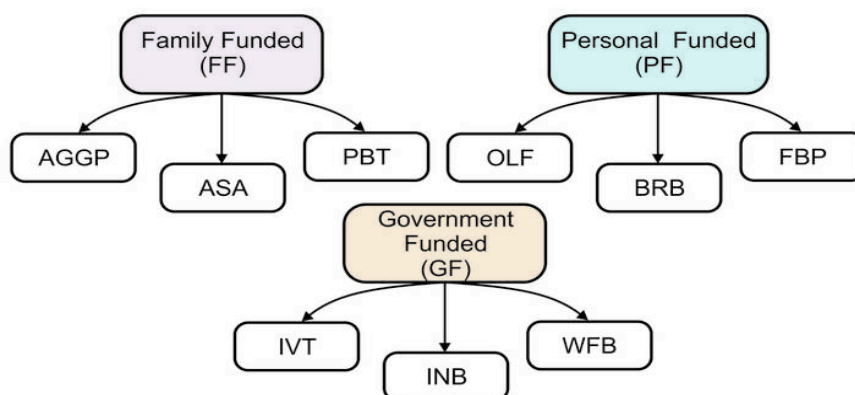
<i>Code</i>	<i>Categories of Themes</i>
IF	Individual Forces
PA	
PK	
BN	
IS	Institutional Support Forces
TF	
SC	Sociocultural Forces
VA	
BL	
	*emerging from data

Table 4.2: Coding According to Individual Cases

CASES		INTERVIEWEE	
	Code		Code
Innobiologics	INB	Dato' Dr. Nazlee Kamal	DDN
Alor Gajah Garden Product	AGGP	Dato' Prof. Abu Bakar Mohd. Yusof	DPAB
Invitro Tech	IVT	En Shukri Ibrahim	SI
Asma Agro	ASA	En. Hisham Jabir / En Sabri Jabir	HJ/SJ
Power Biotechnologies	PBT	Dr Nasir Abd Rahim / En Omar Mustafa	DNAR/OM
Brass Bakti	BRB	En. Rahman Rahmat	RR
Orchid Life	OLF	En. Razak	ER
Farmina Biopharmaceutical	FBP	Dr. Hajah Farmina Hassan	DHF
Watergen Biosystems	WFB	En. Nazmi Said	NS

Note: Interviewer - Amiruddin Ahamat (AA)

Diagram 4.2: Grouping of Cases



Systematic coding of raw data obtained from fieldwork activities helps to address the issue of managing the complexity of huge quantities of raw data. The coding was done manually using an alphabetical code to represent each case interview. Referring to Diagram 4.2, the codings were segmented into three; the case code, the interviewer code and the interviewee code. This process also allows the researcher to map the different codes tagged with the key themes into the next stage of data analysis. In the analysis stage, the researcher tries to create meaning from the interview conversations while mapping it with the suitable research themes. Consequently, at the interpretation stage, the researcher as the interpreter, search for the core meanings of thoughts, feelings and behaviours described in the transcribed data. Here, the researcher identifies how the pre-set themes and the emerging themes relate to each other and how the two key research questions are answered. This supports the idea promoted by Fletcher's (2007):

'Although we are unrelated to the making of the story, as we read and connect with some aspect of it, we can theorize beyond the telling of it. This is because, as a community of researchers, we have a set of rules, conventions, ideas and strategies for interpreting the story. Likewise, even people who are not directly familiar with the scholarly work of entrepreneurship are able to connect to the story. This is because people label, categorize and construct things as 'entrepreneurial' about understandings they have derived from different exposures (media, education, family) —interpretations and understandings which they 'bring into being' and 'take forward' through dialogue and interaction.' (p. 665)

4.7 Analysis of Interview Data

The process of collecting and analyzing the qualitative data, such as through an interview, is an interactive process in which the analysis usually begins during the data collection stage itself (Hesse-Biber & Leavy, 2006). In the context of this study, the interview data were first analyzed when I listened to my audio interview recording on the computer during my field

works in Malaysia. A total number of nine respondents were interviewed in the actual data gathering process for this study. The length of the interviews was between 1 to 2 hours. It could be valuable for the interview to be transcribed and translated immediately after it was done as suggested by Green (2005), but this was not possible due to the busy schedule of my field works in Malaysia. Therefore, the process of transcription and translation were only done after the end of the field works. At this time, permission was sought from the respondents to reproduce the interview transcripts in the report. All nine interviewees granted permission to use the full interview transcript in the report. The information extracted from the interviews was examined closely and the findings were reported directly, without further data reduction or analysis. The raw interview data for the study were first transcribed and translated using transcription software, Transcriptions. This software helps the researcher to incorporate audio files with the document files in one platform. This feature facilitates the process of transcribing and translating the raw data from the interviews. The transcribed data were then analyzed manually.

During the transcription and translation, I found myself making notes from time to time whenever I came across important concepts, themes or events that emerged from the interviews. Consequently, I would also highlight in colors and tag with comments whenever I came across quotations that could usefully in answering my research question. While, the highlighting and comments also helped me to enhance my understanding of the important points made in the interviews as well as allowing me to seek their intended meanings (Rubin & Rubin, 2005). Prior to undertaking the actual part of analyzing my interview data, I listened again to all my recorder interviews and compared them with the produced texts. This practice was crucial for me to check on the accuracy of my interview data in order to confirm their reliability (Poland, 2003). As this thesis employs case study analysis, the next sub-chapter elaborates the role of case study in the light of the methodological application.

4.8 Case Study

This study adopted a case study approach as suggested by Yin (2003) to gain a more comprehensive understanding and insight of the entrepreneurial opportunity creation process by Malaysian biotech entrepreneurs. According to King (1994), in order to explore the underlying (subjective) reasons for entrepreneurs' particular actions and interpretations, the semi-structured qualitative approach is deemed to be appropriate. This approach enabled the researcher to address the process-based issues concerning why events happened and how they unfolded over time (Denzin & Lincoln 1998). Yin (2009) posits that there's no formula to determine the justification of one research on using a case study

approach. However, he suggested that there are three conditions that supports the use of case study approach (a) the type of research question posed, (b) the extent the control an investigator has over actual behavioral events, and (c) the degree of focus on contemporary as opposed to historical events. (p.8). Firstly, the context of this thesis, is to investigate the process of entrepreneurs' opportunity discovery and creation, analyzing from the messages that entrepreneurs presented in the influence of three main forces of the individual, institutional supports and socio cultural contexts. To address this research question, the form of research question needed is how and why the entrepreneurial opportunity existed.

Yin (2009) suggests that any questions that seek to explain some present circumstances (i.e. 'How' or 'why' some social phenomena works) requires an extensive and 'in-depth' description of social phenomenon. In the context of the thesis, this demonstrates the richness of what is happening and emphasizes they way that it involves entrepreneur's intentions and actions on their strategies towards identification and creation of opportunities. Additionally, as a researcher, my control as an investigator over the actual behavioral events, responses and ideas, on the respondents was very limited. Researchers argue that the domain of the entrepreneurship field centers on opportunity recognition, evaluation, and exploitation (Aldrich & Ruef, 2006; Shane & Venkataraman, 2000; Venkataraman, 1997), in which the degree of focus is on contemporary issues in Malaysia. Case study approach has many advantages and is appropriate for examining: (1) contemporary or ongoing phenomena not divorced from their real-life context; (2) phenomena that are systemic in nature, with a number of forces acting upon the system simultaneously; (3) phenomena that are contextualized such that it is difficult to separate the phenomena from their context, as can be done in an experiment (Yin, 2003; Tsoukas, 1989). The case studies are facilitated through the interview data collection, coupled with content analysis of similarities and dissenting answers (Yin, 2003). Building on these arguments, the thesis suits very well with case study as a preferred research method. The brief profiles of cases analyzed in the next three chapters are summarized in the below Table 4.3: Table of Biotech Entrepreneur's Cases.

Table 4.3: Table of Biotech Entrepreneur's Cases

Cases	Category	Type of Business	Size ²	Interviewers
Powerbiotechnologies Sdn Bhd	Family Funded	Agro and industrial bio-remedial industry	7	Dr. Nasir En. Omar
Asma Agro	Family Funded	Production and supply of plantlets of elite selected clones.		Mr. Sabri Mr. Hisham

² Number of full time employees during the time of the interviews in 2010

Alor Gajah Garden Products (AGGP)	Family Funded	Bio-herb Producers	3	Dato' Prof. Dr. Abu Bakar Mohd Yusof
Brass Bakti	Personal Funded	Manufacturer of multipurpose spraying bio-liquid fertilizer and basic liquid fertilizer	5	Mr. Rahman Haji Ahmad
WaferGen Biosystem	Personal Funded	Leads in the development, manufacture and sale of state-of-the-art products for genomic analysis for the life science and pharmaceutical industries.	12	Mr. Nazri
Orchid Life	Personal Funded	Bio horticulture	5	Mr. Razak
Innobiologics	Government Funded	Advanced production of GMP Biopharmaceuticals	25	Dato' Dr. Nazrul
Invitro Tech	Government Funded	Research and development of plant and tissue culture technology	6	Mr. Shukri
Farmina Biopharmaceutial	Government Funded	Biotechnology, biochemic and homeopathy-based activities involving herbs	8	Dr. Farmina

4.9 Conclusion

The research methodology represents an essential element in thesis writing. It allows the researcher to systematically frame the study to address the research question and to achieve the aims of the research – it guides them onto the proper research path. Hence, this chapter discusses and explains the methodological considerations, methodological approaches and research design for the study. Seale (1999) claims that an examination of the methodological considerations and research design may benefit the quality of the research by encouraging a degree of awareness about the methodological implications of particular decisions made during the project. The study employs the interpretive inquiry approach, analyzing and interpreting the data following the methods suggested by Limb and Dwyer (2001) and Rogers and Viles (2003). It interprets the symbolic forms, narrative, arguments, conversation and setting which characterize the research context (in this case biotech entrepreneurs). In addressing the issue of opportunity discovery and creation, this thesis uses case study a tool to operationalize the research. This research technique was selected as it is useful for examining an experience in its natural settings (Benbasat, 1984) in the area entrepreneurship in biotechnology. This study has also used multiple sources of evidence, drawing upon industrial reports (Ernst & Young, MBC, Malaysian Industrial Reports), structured interviews, in-depth interviews and observations from a range of case

studies. According to Yin (2009), the use of multiple sources allows an investigator to address a broader range of historical and behavioral issues, most importantly enabling the development of converging lines of inquiry, and the process of triangulation. This strategy allows the investigation of complex issues such as the recognition, discovery and creation of entrepreneurial opportunity, using multiple methodological approaches, thereby contributing to the range of methodologies available to study the field of entrepreneurship.

Chapter Five

Malaysian Biotechnology Case Study – Family Funded Entrepreneurs

5.0 Introducing the Analysis Process

The aim of this chapter is to explain the analysis process of the thesis. This includes the data collection process, the rationale of cases selection and the analysis of cases. The research was divided into several stages. First, the biotech industry was reviewed to identify the key players. Several leading entrepreneurs were approached based on recommendations from MBC and personal contacts. Their cooperation's were sought to ensure the success of the project. Secondary data of industry' reports were obtain from various resources including biotech industry reports, financial reports and MBC brochures. Then, the current CEO of the company was then interviewed to explore his thoughts and ideas on the growth and development of his company. The CEO certainly had played a central role in managing his business throughout the growth period. Therefore, he/she had a deep understanding of how the business developed and expanded. The interview was tape-recorded and transcribed before it was translated (interviews was conducted in the Malay language, Bahasa Malaysia) and the data systematically checked for accuracy and patterns of key themes. Following the primary (interview) and secondary data collected, the thesis presents a case analysis of three groups of entrepreneurs namely family funded, personally funded and government funded entrepreneurs. The case study is vital in order to understand the entrepreneurial opportunity creation process underwent by all nine entrepreneurs divided into three main groups.

Consequently, the analysis of the data was analysed based on the conceptual framework proposed by Rubin & Rubin (2005), who posit that the analysis should be guided by the research question and the proposition, and should also identify the important concepts and themes offered in the study. The important concepts and themes were identified and presented and later separated into different categories of opinions, ideas, suggestions that demonstrates entrepreneur's activities to recognize and create business opportunities. The context of analyses of all nine cases from three chapters (chapters 5,6 and 7), explain the process of opportunity discovery and creation of entrepreneurs shaped by the individual, institutional supports and sociocultural forces. Additionally, Gall et al. (1996) outlined three approaches to case data analysis: a. interpretational analysis³, structural analysis⁴ and

³ Here, the thesis is looking for patterns (threads, constructs, commonalities, etc.) within the data to explain the phenomenon.

reflective analysis⁵. For the purpose of analysis of cases, an interpretational analysis is chosen to help address the integration of the interpretative approach and sensemaking theory in the entrepreneurial opportunity investigation in this thesis.

5.1 Rationale of Cases Selection

The interview respondents for this study were identified through three different means: (1) identified by the researcher (2) introduced by key informants and (3) snowballing that is one respondent leading me to another respondents. In all of the cases, the suitability of the interviewees for this study was determined mainly on the basis of their ability to provide data or information relevant to the research questions of this study and their ability to contribute further to proffered explanation (proposition/research question) that the study is developing (Mason, 1996). Acknowledging the nature and busy schedule of my respondents, all interviews were undertaken at places and time that were most convenient to the interviewees according to their request. The research participants include entrepreneurs from three different areas of the biotechnology industry: government funded entrepreneurs, personally funded entrepreneurs and family business funded entrepreneurs. The three categories were chosen in order to allow me to examine the key themes of opportunity discovery and opportunity creation from three different contexts. These interviews were complemented by an in-depth interviews and a personal observation on biotech entrepreneurs. These approaches were determined as beneficial and insightful for the purpose of this thesis.

The following step is the first stage data collection activities (fieldwork) and this includes interviewing nine carefully selected biotech entrepreneurs from three different categories, namely government funded entrepreneurs, personally funded entrepreneurs and family funded entrepreneurs. The rationale for this choice is to analyze different patterns from different categories of entrepreneurs. All research participants were purposefully sampled according to three categories. For the purpose of cases selection, I adopt the 'snowball or chain sampling', which identifies cases from people who know people who know what cases are information-rich, that is, good examples for study or good interview subjects (Patton, 1990:182). There are both potential advantage and disadvantage of this sampling approach. One potential advantage it is possible to include members of groups where no lists or identifiable clusters even exist (Black, 1999). However, in the context of this thesis, this was

⁴ Investigating patterns which may be found in conversations, text, activities, etc., with little or no explication as to pattern meaning.

⁵ The description and evaluation of the analyzed phenomenon based on judgment and intuition by a highly qualified expert.

not the issue. Six research participants were recommended by the governing body of the biotechnology industry in Malaysia, the Malaysian Biotech Corporation (MBC) from their official lists, prior to the interview sessions. While the other three research participants were chosen from personal business and social networks from the biotechnology industry in Malaysia. Using contacts from industry, academia and friends can be helpful; initially in establishing what the *population* is of organisations one might draw the case study from, and then for how to choose the case(s) (Hartley, 1994). However, the disadvantage of snowball sampling is no way of knowing whether the sample is representative of the population (Black, 1999).

5.2 The Analysis

There are currently many definitions on the terms family firm or business. This thesis follows Chua et al.'s (1999) definition of a family business as 'a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families' (p.25). Here, all three cases are categorised as family firms, based on the nature and source of funding that is received from family members. To start the business, the funding is either sourced partially or fully from known family members such as husband, spouse or uncle. The three case studies that follow each have a number of common features. They each illustrate how various antecedents in the biotechnology industry can be facilitated into business opportunities. Each case study presents the process of opportunity enactment within the influence of three dominant forces of individual and institutional support and sociocultural forces. The process includes the role of passion, past career/knowledge experience and business networks. The importance of appropriate institutional support mechanisms for biotech entrepreneurs and their values and beliefs systems are also covered. The analysis of three cases of family funded business are first analysed in this chapter. The background of cases is presented in Table 5.1: Background of Family Funded Cases while the first case presented is Powerbiotechnologies, located in the southern part of Malaysia.

Table 5.1: Background of Family Funded Cases

Cases	Background	Respondents
Powerbiotechnologies Sdn Bhd	Powerbiotechnologies Sdn Bhd is a company founded by two young entrepreneurs who are also qualified professionals. This company consists of a research and development facility and production centre, and it specialises in the agro and industrial bio-remedial industry, with the expertise from the company's	Dr. Nasir Mr. Omar

	microbiologists and biotechnologists.	
Alor Gajah Garden Products (AGGP)	Alor Gajah Garden Products, simply known as AGGP, is a family-founded home-based business founded by Dato' Dr. Prof. Abu Bakar Yusof (Dato' ABY). Utilising several forms of product manufacturing process technology, AGGP strives to plant and produce selected medicinal herbs as supplements to help people in reducing the risks of today's common illnesses, such as cancer, diabetes, and high blood pressure. Among the medicinal herbs produced by AGGP are <i>Mahkota Dewa</i> and <i>Kacip Fatimah</i> . AGGP sells its products directly to the end users and, as a promotional effort, this company also encourages customers as well as potential customers to visit and sample its products.	Dato' Dr. Prof. Abu Bakar Yusof (Dato' ABY)
Asma Agro	Asma Agro (M) Sdn Bhd is involved in the production and supply of good quality plantlets of elite selected clones. Through its breakthrough and expertise in the micro-propagation tissue culture technology, Asma Agro has succeeded in creating high yielding plantlets that consequently maximise returns in agricultural investment. As a result, in 2007, this company was awarded BioNexus Status Company, the official recognition from MBC. The two main crops developed by Asma Agro are the DINAR Pineapple (MD2) and the Dwarf Cavendish Banana (Grand Naine). These products have helped farmers and plantation corporations to flourish in their farming yields and techniques. Asma Agro was established by two passionate brothers Hisham Jabir and Sabri Jabir in 2006 with the motivation of filling the gap in market demand to produce high-end pineapple and banana plantlets in the bio-agricultural industry.	Mr. Hisham Mr. Sabri

5.3 Case 1: Powerbiotechnologies Sdn Bhd

5.3.1 Individual Forces

5.3.1.1 Passion

Dr. Nasir used his skills and vast experience in the biotechnology industry and as a research scientist with a successful government-linked corporation to start partnering with a family member, Mr. Omar, providing microorganism propagation solutions to various industries. Dr.

Nasir left Johor Corporation⁶ after serving for more than 20 years with the company to set up the new entrepreneurial business venture. Entrepreneurship can be linked to career dynamics due to the fact that an individual often leaves one organisation to establish their own (Dobrev & Barnett, 2005). Similarly, Sorensen (2007) claims that 'entering entrepreneurship is a labour market transition: leaving employment with established organisations for self-employment' (p.390). It was the continuity of his passion in biotechnology, which drove him to engage Mr. Omar to start the new venture. Given the uncertain success of launching new products and services, and the challenges of developing new organizations with limited resources, passion can become a key driver of entrepreneurial action (Cardon et al, 2012). Additionally, passion can "fuel motivation, enhance mental activity, and provide meaning to everyday work" (Brännback et al., 2006: 6). It can foster creativity and the recognition of new information patterns critical to the discovery and exploitation of promising opportunities (Baron, 2008; Sundararajan and Peters, 2007). Moreover, passion has been associated with the ability of entrepreneurs to raise funds from investors (Cardon et al., 2009b; Mitteness et al., 2012; Sudek, 2006). Upon receiving institutional funding and being accredited as a BioNexus company by MBC, Powerbiotechnologies became a dynamic, profitable business, which supplies a microorganism propagation service to address the issues of industrial wastage and environmental pollution. Furthermore, the services offered by Dr. Nasir's company matched the needs of the country, Malaysia, to promote green technology and the ideas that support environmental sustainability.

Despite the limited financial resources, the company was able to engage in potentially fruitful collaboration with several Indian technology providers to support their products/solutions. This was made possible through selective participation in relevant trade exhibitions to expose their business, brands, and service to the markets. Consequently, trade exhibitions (Ellis 2008; McAuley 1999; Meyer and Skak 2002; Reid 1984) have been found to be sources for information and social ties, creating the potential for entrepreneurial opportunity discovery. However, the role of exhibitions as a source of social ties is complex. According to Ellis (2000), in the context of exhibitions, the communication of opportunities cannot be uniquely attributed to a buyer, a seller, or a third party (such as a government agency). Dr. Nasir acknowledges the importance of attending specific events such as trade exhibitions increase his and his company's stock of knowledge. Furthermore, he could engage himself in a larger pool of social interactions hence building potential network ties with other exhibitors. Trade exhibitions and similar forums where people share common interests are a

⁶ A successful Malaysian conglomerate and a state-owned firm.

context with a dense network: the proportion of potential network ties is high (Coviello 2006) and this functions helps explains Dr. Nasir's technology and business to a wider audiences be it those who are interested the biotech or anyone who are looking at new opportunities. However, Ellis (2000) suggests that it is appropriate to treat exhibitions as a special kind of initiation scenario. However, the challenge for Dr. Nasir and his company is to select the right exhibitions that could attract interested and serious individuals sharing the same passion in biotech business.

5.3.1.2 Prior Knowledge/Experience

During the years 2009 and 2010, the company actively participated in relevant trade exhibitions in Malaysia and abroad. This allowed Dr. Nasir and his partner Mr. Omar to discover and create new markets though several business interactions that helped them to attract valuable information and key individuals to facilitate business activities. Dr. Nasir deployed the word of mouth marketing (WOMM) strategy rather than engaging in the sophisticated marketing tools approach to achieve the customer's acceptance of his newly developed technology. Dr. Nasir recalls: *'we use word of mouth. We don't have to play golf; we don't have to do that. If our product is good, everybody comes over. When we organise an exhibition, people from overseas come over'*. As suggested by Pitts and Snow (1986), word of mouth and other limited advertising strategies are widely deployed by small and new businesses which are struggling to gain market share. Powerbiotechnologies considered as a small and new business apparently grapples with such issue to position and locate their business central to the biotech industry. Hence, Dr. Nasir and Mr. Omar extracted cues from the supply of information gathered through trade exhibitions and enacted delivery of good service to their clients.

In sensemaking, they participated in dialogues and social activities that lead to the discovery of opportunities. Dr. Nasir suggests that by 'producing good quality products' it translates into repeat purchase, and thus promoting building positive WOMM. His and his company's strategy was extracted from relevant cues available from the biotechnology industry and his vast career experience and knowledge of biotechnology activities. These cues influenced him and his partner to spot and decide relevant and useful information in which the company secured a valuable business relationship with FELDA⁷. FELDA has 77 mills and when 1 mill uses Powerbiotechnology's solution, the remaining 76 mills will follow suit. This further supports the argument of Grewal et al. (2003), that individuals are more inclined to believe

⁷ The Federal Land Development Authority or FELDA was established on 1 July 1956. FELDA's vision is to become the world leader of oil palm industry and settlers being part of the middle income group.

WOMM than the more formal forms of promotion methods; the receiver of word of mouth referrals tends to believe that the communicator is speaking honestly and is unlikely to have an ulterior motive (i.e. they are not receiving an incentive for their referrals).

WOMM represents a special channel because it may sometimes play a key role in a marketing campaign, and so a strategy is affected by social factors, as in the way that Powerbiotechnology's audience, clients or ordinary people extracted cues from news and informal information about products or business to help them (the audience) decide what product is good and what product is unacceptable. WOMM depends on the extent of customer satisfaction with the product or service (Stach & Sorenko, 2010) and on the degree of its perceived value (Turel et al., 2010). The process is ongoing and clients or customers extract cues from news and informal information. Yet, Dr. Nasir and his partner, Mr. Omar, try simultaneously shaping and reacting to the current business environments that they are facing. Taking account of the inherent characteristics of small firms (in this case, Powerbiotechnologies) and their owners (Dr. Nasir and Mr. Omar), Carson et al. (1995) argued that marketing in small firms has a distinctive style and unique characteristics that are different from the classical approach. The limitations of resources manifest themselves in certain marketing approaches such as WOMM, but it is effective in its objectives. Consequently, building on the prior knowledge/experience of Powerbiotechnologies founders, opportunities is recognising within the social interactions frameworks of business exhibitions and in-direct approach of marketing through WOMM.

5.3.1.3 Business Networks

The ability to discover and develop business opportunities is often considered to be among the most important abilities of a successful entrepreneur, and this has consequently been a key issue to investigate and explain in literature and research on entrepreneurship (Ardichvili, Cardozo, & Ray, 2003; Ronstadt, 1988; Shane & Venkataraman, 2000). Several scholars have pointed out that experienced entrepreneurs have acquired valuable knowledge about relevant contacts, reliable suppliers, viable markets, product availability, and competitive resources and response, which enhance their ability to spot and seize entrepreneurial opportunities (Hudson & McArthur, 1994; Ronstadt, 1988; Shepherd et al., 2000; Starr & Bygrave, 1992). These contacts may include social and community networks. Rae (2007) argues that social and community networks and connections provide many experienced entrepreneurs with subsequent business opportunities. Through their networks, they become aware of opportunities and are able to use these to develop business ventures.

In the case of Powerbiotechnologies, Dr. Nasir and Mr. Omar adopted the selective approach in seeking to influence certain groups by employing strategies such as attending formal meetings with customers rather than engaging in personal social activity such as playing golf. Dr. Nasir reiterates that the critical part of network building is not the technique of building business networks. He argues that the priority for his business is to have good technology and products rather than developing social network groups through golfing. In short, he and his partner believe that the product/service offered to the market should be of good quality. Dr. Nasir suggests that formal and business networks carry different values and strengths. As one involved in the biotechnology business, he claims that only a few of his and Mr. Omar's contacts were useful to facilitate their business, and most were totally irrelevant and had to be discarded. Dr. Nasir suggests that a direct approach strategy would be most suitable for his business marketing strategy, relating to Johannison's (1998) notion that a knowledge base (adding emphasis to biotech firms) builds primary networks almost as much as the spatially concentrated (more focused) methods of business strategy for traditional entrepreneurs. Dr. Nasir posits in his statement;

For us to go one by one is difficult. So we have friends. The one related to chicken farming. Do a bit of reference. We meet only once. After that, already, in our market, those from the lower level have to be helped; those on the top level have to be helped as well. We have to do presentations on technical sales.

Case PBT (FF). Personal Interview. 11 February 2010, p.41

Dr. Nasir's view contends the basic idea that lies in opportunity creation process, the business network through effective social relationship of friends. Sociologists, social psychologists, and social anthropologists have developed the concept of exchange in interpersonal relationships within a societal environment (Homans 1958; Thibault and Kelley 1959). Exchanges in social relationships are viewed as interaction processes where the inter-action is any set of observable behaviour on the part of at least two individuals when there is reason to believe that some parts of these individuals are responding to each other (Hallen et al, 1991). This form of exchange process, in which two or more individuals simultaneously affect and are affected by each other in relatively enduring ways, is also an adaptation process (Newcomb, Turner, and Converse 1952). Hence, Powerbiotechnologies business is facilitated through relevant exchange of contacts driven by Dr. Nasir, Mr. Omar and other staffs of the company. At this stage, the value of contacts shapes how opportunity is recognized and created. The framework of opportunity recognition/creation proposed in this thesis help to explain the different elements that business networks contributes in shaping entrepreneurial opportunities.

5.3.2 Institutional Support Forces

Most entrepreneurial development initiatives continue to be influenced around programs to enhance individuals' competency skills, integrate entrepreneurship into national economic development efforts, use the education system to shape and encourage future entrepreneurs, incubate entrepreneurial firms, invest in diverse sources of activities as well as creating the infrastructures, and create a competitive tax policy and regulatory climates. Mohd. Rosli (2000) views, the earnestness with which the government promoted entrepreneurship and its SME development programs in the early days led to the involvement of a large number of ministries as well as government and non-government agencies. The objective of entrepreneurship policy is to motivate more new entrepreneurs with the focus to inculcate entrepreneurship culture/climate (Stevenson and Lundstrom, 2001) and this influenced the Malaysian government, through MBC, to provide supports in billions of Ringgits in the forms of grants and funding to facilitate biotech entrepreneurs. Many attempts have been made at policies that enhance financing offerings to entrepreneurs (Harrison, Mason, & Girling, 2004). Specifically, governments have tried to reduce financial constraints faced by entrepreneurial ventures by adding instruments like mutual credit guarantees and micro-finance schemes to traditional bank loans (Minniti, 2008). In Malaysia, both private and government institutions offer various types of financial incentives in the form of grants, matching grants, and loans to support biotech ventures. As a result of the BioNexus status initiative (government policy), many entrepreneurs are given seed fund grants to start their businesses. Powerbiotechnologies was awarded a seed fund grant to support their business venture. Dr. Nasir recalls:

It is true that finance is very important, as that from MBC. We're very thankful also of course. Actually, MBC have given us a grant of RM2.5 million, and we have managed to develop three factories.

Case PBT (FF). Personal Interview. 11 February 2010, p.18

Yet, Powerbiotechnologies was able to secure a grant of RM2.5 million and later developed three factories. Through institutional funding Dr. Nasir's business was able to obtain low cost technology to raise microorganisms to create good business value for his company. Looking at it retrospectively, using the combination of his prior knowledge and skills, both from formal learning and practical work experience, and market research, his business employs a technology that is proven. Formal education, especially in combination with relevant experience and the tacit knowledge it builds, appears to be a general determinant of success in business venturing (Vesper 1990).

5.3.3 Sociocultural Forces

Dr. Nasir and Mr. Omar both have something in common when it comes to society. Dr. Nasir defined opportunity creation through business as a contribution to society. He views business as not merely profit earning activities, but as one form of contribution to society. He recalls, *"If we want something to do with society, we want to serve the citizen, the people. I mean, giving a good product. Giving a good product to them. Living in society, there are many problems. Bad smells cause a lot of problems, dirty water causes a lot of problems, and trees that are not yielding also cause a lot of problems."* Nevertheless, Dr. Nasir extracted cues through social learning experiences, and managing various kinds of technology for his former employer, the Johor Corporation, was a valuable learning process that allowed him to value corporate cultures as useful information to his business venture. Dr. Nasir recalls that the success of his former employer, the Johor Corporation, was associated with the corporate culture of the founding leader of the corporation, Dato' Ali Hashim. Schein (1985) suggested an evolutionary view of corporate culture that used the founder's values and belief system as an anchor but also incorporated new learning over time, as the organisation interacted with the world at large. Because of the dominant role of the founder, not only during the entrepreneurial period but also potentially through successive stages, their values and owner motivations are powerful cultural drivers (Denison et al., 2004).

It was one form of 'role or identity borrowing' by Dr. Nasir that he referred to when he responded on the positive values he inculcated from the founder leader of the Johor Corporation. Such 'role or identity' borrowing has positively influenced the business survival of Powerbiotechnologies for the past ten years of operation. Bruderl and Preisendorfer (1998) claim that entrepreneurs who had several years of work experience increased their ventures' three-year survival rates, and thereby reduced the likelihood of new venture failure. Also, Duchesneau and Gartner (1990) indicated a positive relationship between founders' management experience and new venture survival, pointing out that founders of failed ventures had narrower management experience than the founders of successful ventures. In retrospect, it can be seen that Dr. Nasir gained sufficient skills and experiences, providing him with the important soft and hard skills of managing a business venture. Dr. Nasir also acknowledged the role of the Johor Corporation as *"a university and an experience; because the Johor Corporation is involved in many business activities. Because it's got land, it's got a hospital, it's got an industrial estate, and it's got a hotel."* Stafford et al. (1999) observed that ownership carries with it the option for families to define success on their own terms. The role of the founder is crucial to establishing an organisation's identity, core beliefs, and

purpose (Denison et al., 2004). In sensemaking, it is a social process in which entrepreneurs, say, single out and reach conclusions determined by various social factors. The conceptual framework in this thesis promotes greater explanation on the influence of institutional and cultural values in opportunity enactment process. The framework complements the critical role of individual's identity within the process.

5.4 Case 2: Alor Gajah Garden Products (AGGP)

5.4.1 Individual Forces

5.4.1.1 Passion

Dato' Dr. Prof. Abu Bakar Yusof (Dato' ABY) demonstrated a complex blend of experience starting from an accountant for a private company to an entrepreneurship professor at the public university. He presented a long career history in several private and government agencies for almost 40 years prior to his business venture engagement. Dato' ABY posits his involvement in business venture as learning acumen from the prior knowledge and career experience he gained over many years. This is evidenced from the story he told:

I picked up all the experience from my workplace. I started with MARA⁸. It is an entrepreneur organisation that helps small business. That's number one. Number two is the University Putra Malaysia (UPM) where I saw a lot of things – plants and herbs – being planted. This programme is about the expansion of facilities (in UPM) where we deal with SME. We also have an expansion programme for the village people, where we teach them how to plant these trees and herbs so that they do not totally depend on the government. As academic staff, I am teaching entrepreneurship.

Case AGGP (FF). Personal Interview. 3 February 2010, pp.2–4

The interview done at his house and it was very informal and recalled his passions and interest about herbal products, namely five kinds of herbal teas produced using bio-processing methods: *Misai Kucing* tea, *Kaca Beling* tea, *Mas Cotek* tea, *Mahkota Dewa* tea and *Stevia* tea. Dato' ABY spoke with confidence on his topic of interest, the function of *Stevia* tea for diabetic people. He recalls, "*Stevia tea. It is for diabetic people, sugar free but it tastes sweet. When you drink the tea, it lessens body odour.*" Dato' ABY's passion for the herbal tea products business was a retrospective sensemaking action, a notion Weick (2001) defined as when individuals interpret and make sense of events and situations using

⁸ The People's Trust Council (MARA), an agency of the Ministry of Rural and Regional Development, Malaysia, was established on 1 March 1966 under an Act of Parliament as a statutory body as a result of the first Bumiputera (native) Economic Congress resolution.

a lens of experiences and understanding. Dato' ABY clarified his engagement in MARA to help small businesses. He was also working in the finance department, facilitating students who were interested in developing agricultural business activities at UPM, Malaysia. Hence, Dato' ABY considered that planting and selling herbal products was his hobby.

I consider it {planting and selling herbs} as a hobby. [It] started as a hobby. Then I planted all the herb plants. Then we try to make the tea, and then we modify and try to improve it until we feel that it is the tea that we want.

Case AGGP (FF). Personal Interview. 3 February 2010, p.2

The passion of Dato' ABY in herbal business was not built in one day but it was an accumulative experience of intense positive feelings. Intense positive feelings are central to scholarly research on passion in psychology (cf. Damasio, 2003; Schwarz and Clore, 2007), organizational behavior (Liu et al., 2011), and entrepreneurship (Baum and Locke, 2004; Baum et al., 2001; Chen et al., 2009; Perttula, 2010). Passion thus consists of deeply experienced positive feelings for something important to the entrepreneur and, as a result, is more enduring than the experience of episodic emotions associated with external stimuli (Wincent et al., 2008) in this case the accumulated good and bad experiences that Dato' ABY gained throughout his careers. Building on these, he developed a schematic process on spotting any potential opportunities and what it means to his hobby. Nevertheless, entrepreneurs are those who "discover and exploit new products, new processes, and new ways of organizing" (Baum and Locke, 2004: 588). Although these pursuits can take many forms, entrepreneurial efforts are generally defined in terms of the recognition and exploitation of business opportunities, notably through the founding of new ventures (Baron, 2008; Venkataraman, 1997) in this case through activities that drives entrepreneurial passion and intense positive feelings.

5.4.1.2 Prior Knowledge/Experience

Personal interests or hobbies can provide a means of learning about a particular activity and starting a business, either early in working life or, as is increasingly common, after a career in employment (Rae 2007). In the case of AGGP, it was an interest and hobby that drove the respondent into a business venture. Rae (2007) claims the term 'lifestyle' or hobby⁹, turning a leisure interest or hobby into a source of income; if the number of hobby-based businesses were counted they would be very large indeed. Dato' ABY argued that his business venture allows him to do something with his own passion and interests in green lifestyle activities, for example transforming herbal tea plants into commercially manufactured herbal supplements

⁹ Adding emphasize of what Rae (2007) means by the terms lifestyle.

and teas. He claimed that the green lifestyle was one solution to the current health issues in Malaysia. Dato ABY presented a green lifestyle identity. It is this identity that shapes what he enacts, and how he interprets events and actions. Dato ABY discovers and creates business opportunities through the dialogues and narratives he faces in the environments in which he interacts. Nevertheless, his identity of green lifestyle translated his interests into business. Jaffe (1988) saw great power in the shared history and identity of family members when remarking, "The personal history of a family business is very special, because it is the story of a family and its way of making its mark in the world." Certainly, Jaffe felt that neither family nor business could be viewed in isolation, even suggesting that problems in the business should be approached within the sphere of the family. Dato' ABY demonstrates lacking of knowledge in technical aspect of the herbal (biotech) and thus this limits here his business expansion. Historically he was an accountant by profession. Operating as family business with two man business operations, limits his business expansion.

Furthermore, with limited financial and technical resources in the area herbal biotech, he and his business suffer from the "liability of newness". Prior research has observed that young or "new" firms face particular difficulties and greater risk of failure. Stinchcombe (1965) posits that new organizations are more likely to fail for because of new organizations involve new roles that have to be learned and new organizations do not yet have standard routines to solve problems. The prior knowledge and experience has not adequately add values to his business as he (at the time of interview) was earning sufficient income as full time professor rather the activities done was part time rather and hobby rather than a full time business venture. This presents as stumbling block to him to further advanced to the next stage of enacting potential business opportunities. Nevertheless, his knowledge/experience has very limited impacts on the opportunity creation efforts.

5.4.1.3 Business Networks and Institutional Support Issues

Dato' ABY acknowledged the challenge of obtaining monetary help from government agencies, despite serving in government for the past 40 years. His view was that institutional funding was slow to reach the entrepreneurs due to bureaucracy. Considered retrospectively, his view on the issue of bureaucracy was a reflection of his direct interaction while working for MARA. In MARA, Dato' ABY was responsible for managing and distributing funding to qualified entrepreneurs. However, the extracted cues from his past formal business and social interactions do not influence much his ability to gain access to valuable business networks, and key information and decisions that might facilitate the process of securing funding. Dato' ABY indicates that he did not feel comfortable and was a bit shy

about engaging with his circle of networks at the Malaysian Institute of Accountants in order to communicate his idea and business of a green lifestyle. This demonstrates his personality and identity. The identity perhaps hinders his ability to extract cues from the business context to help him and his wife decide on what information is relevant and what explanations are acceptable. Dato' ABY shares his views:

You feel a bit shy you know. You are a professional accountant. Now you believe in herbs. So those two contradicting factors – they are going in different directions. So people will start thinking, oh, from a professional, now you grow herbs. But like I said – a hobby – a hobby can be anything. Some people like to fly. Some people like to drink until they get drunk, you know. Some people go fishing for hours and hours and they catch nothing. But with herbs, you are guaranteed. If the herbs grow well then the herb tea is there. The herb is guaranteed – and a systematic kind of approach to get money, you know.

Case AGGP (FF). Personal Interview. 3 February 2010, p.11

However, it was quite surprising to observe Dato' ABY's sense in grasping valuable cues of the potential market demand for *Mas Cotek* liquid – half a billion litres a year from the U.S. despite his company's inability to supply in such a huge quantity. He connects his views:

The potential is there. You know that for the *Mas Cotek* herb – even the American government is talking about their requirement – half a billion litres per year. But who can produce that extraction, that extract from *Mas Cotek*? They need about half a billion litres. But again, half a billion litres is not a small quantity. It is a very big one. Maybe we would require about one hundred thousand hectares of palm oil estate to produce that quantity. The production depends on the rate of growth of the *Mas Cotek* – because they can live easily and die easily.

Case AGGP (FF). Personal Interview. 3 February 2010, p.13

Dato' ABY acknowledges that his business was funded by him and his wife. For him, seeking funding from governmental institutions was challenging as he claimed that as one reaches retirement age, financing would be difficult to get. Dato' ABY's view is that his business operates from home and is small scale. During the interview, Dato' ABY was critical towards the government's policy on entrepreneurship in Malaysia. He claimed that it was hindered by the closure of the Ministry in charge of SME after two years in operation (2007–2009). Dato' ABY believes that the government's policy to discontinue the Ministry was not plausible and not an acceptable action; he claimed that it was the act of *no direction*. He relates:

They closed it. They closed it back. So now, now it's about two years. Two years now, and all the agencies and the people, especially the small and medium industry operators, they have no direction. They don't know where to look for help, where to look for information, because everybody is just, just pretending, they don't know anything. They say that because they don't want to take responsibility because of the close down of the Ministry.

Case AGGP (FF). Personal Interview. 3 February 2010, p.7

Connecting with the theoretical framework, this case signifies that, government's action on entrepreneurship policy means differently to entrepreneurs. Furthermore, from the entrepreneur's message, there was a clear gap of common understanding on what policy should be in place to facilitate entrepreneurial activities in Malaysia. While, this influenced how entrepreneurs to spot and create business opportunities. The liability of newness (Stinchcomb 1965) and smallness (Baum 1996) constructs assumed that a new firm does not have sufficient resources. To address this issue entrepreneurs in one way or another adapt to resource combinations. All efforts to exploit entrepreneurial opportunities involve some innovation, because entrepreneurs' resource combinations cannot be complete and perfect replications of resource combinations used by others (Shane, 2012). Here in the case of AGGP, despite very limited innovation activities involved, Dato' ABY formulates strategic use of external resources through inter-firm networks (Lorenzoni & Ornati, 1988; Jarillo, 1989) by informally collaborating with several institutions, namely the University of Islamic Science, Malaysia (USIM) and MARDI (an institution under the purview of the Ministry of Science and Technology) to benefits from collaborator's advanced technology and experts.

5.4.2 Sociocultural Forces

Sociocultural forces influenced the way individual live their lives and thus affect their activities towards opportunity. Rae (2007) defines this kind of opportunity as 'the potential for change, improvement or advantage arising from our action in the circumstances'. At present, with increased quality and standards of living globally, people are more concerned about their health. Globally, people have started to realise this and some have started to change their lifestyles. This includes adopting a green lifestyle, eating more healthy foods and avoiding harmful ones. Changes in lifestyle can translate into a form of demand because of the need, problem or potential demand to be satisfied to a specific group of the population. Several lines of evidence suggest that pattern recognition may indeed play a key role in opportunity recognition (Baron, 2006). It is clear that many opportunities exist for years before they are noticed and developed (p.106). In AGGP case, Dato' ABY, senses the current change in trends and consumer patterns in Malaysia, thus developing the idea of bio herbs to produce and market potential products that could serve the changing trends and demands. Dato' ABY reflects on his views:

That's why these herbs are more towards a green lifestyle. In fact, people like to go back to basics. Go to basics where they don't want any foreign element or chemical coming into their drinks. So the herbs - you just take from the plant, dry it, grind it, and then you boil it and then you start drinking. Filter and start drinking. There is a demand, and, as you can see, it is

not a dying demand. It has in fact increased; people start thinking about the non-chemical kind of products they like. This is what the green life is all about non-chemical products. So they turn to that. This all depends upon if more people talk about the green life, then the business of herbs is coming and we get a better market share. Something like that. Competition – again, with the chemical and non-chemical products.

Case AGGP (FF). Personal Interview. 3 February 2010, pp.8–9

Changing in social trends and awareness helps entrepreneurs to fill the gap of services/products that fits into the context of green lifestyle. Hence, government's policy to promote policy that integrates environmental protections helps accelerate this effort. The role of entrepreneurs is to either push their ideas/products/services into the systems or to refine them to suit the needs and wants to enact greater changes of business opportunities.

5.5 Case 3: Asma Agro

5.5.1 Individual Forces

5.5.1.1 Passion

In building their business, both Mr. Hisham and Mr. Sabri extracted valuable cues from useful market research information obtained from an independent consultant study in order to make important business decisions. The fact that they decided to venture into the area of marrying stem apex tissue culture was due to the technology and the reward opportunities presented by the consultant's report that define this venture as 'lucrative'. Mr. Hisham shared his story:

When we look for opportunity, something comes along that we are offered to buy. To acquire technology, the technology to create or marry stem apex tissue culture – the market is so lucrative. Even during that time, we didn't expect that [the market] is so lucrative, so huge, as the global market for pineapple also changed because of the requirement for fresh pineapple. So, from there we learned that countries like Thailand and Malaysia produce a lot of pineapples. In terms of production, in world production, Thailand is number one and Malaysia is maybe ranked at number thirteen. But in terms of revenue that is generated from these pineapples, Thailand has fallen behind, fallen all the way to below tenth place in the ratings. Malaysia is not even in the top twenty in terms of generating revenue even though production is a lot, but revenue wise, it is not much. And then we can see a trend: those countries with a small amount of production are not even in the top ten list at all – such as Belgium. But in terms of revenue, the country ranks number two, right. It ranks number two.

Case ASA (FF). Personal Interview. 9 February 2010, p.1

Purchasing/acquiring of technology is one mode that advanced opportunity seeking. While, this comes when entrepreneurs map the existing gap within the industry. In the case of Asma Agro, these entrepreneurs make sense of technology and with passion in

agriculture/the supports by the current information on the market opportunities, these shapes how entrepreneurs upscale their ideas/products/services to creating business opportunities. In short, Mr. Hisham and Mr. Sabri, were both alert and they responded immediately to the cues supplied by the consultants? People extract cues from the context to help them decide what information is relevant and what explanations are acceptable (Salancick & Pfeffer, 1978; Brown, Stacey, & Nandhakumar, 2007). It was also from the cues that both of them decided that pineapple canning does not generate a lot of revenue; they do not earn much from it. The market demand is for the fresh pineapple production, at which countries like Belgium are good. Mr. Hisham and Mr. Sabri saw that Belgium's strength lies in its technology. Both of them recall, "*They (Belgium) produce plantlets – MD2 plantlets – and then they grow them in countries such as Ghana, Costa Rica, all those places. They bring the pineapples back to Belgium and they export them into Europe and all of those countries.*" The reason for venturing into pineapples was an act of plausibility, as both Mr. Sabri and Mr. Hisham prefer plausibility to accuracy in accounts of events and in the context of Malaysia's strengths and experience of producing tropical fruits. Hence, the business establishment's aim was to discover and create business opportunities in the biotech environments, an act of opportunity enactment based on relevant cues received from the consultant. Mr. Sabri and Mr. Hisham further reiterate the market demand opportunity in their statement below:

We started with pineapple because we have approximately 42,000–45,000 acres of land for pineapples in Malaysia. For these 45,000 acres of pineapple land – in the year 2004, Malaysia set the target that by the year 2010, our country wanted to plant pineapples – 17, 000 pineapple plants per acre. That is the target for the year 2010. But with the technology, with our technology, we could plant 35,000 to 45,000 plants per acre. So, not in terms of acreage, that full use of acreage, but the market needs around 2.8 billion pineapple seedlings to do this (produce this many pineapple seedlings) on those 45,000 acres. So, for 2.8 billion – if we take let's say approximately what percentage? Even 1%, that is still – one lab capacity could produce 10 million [seedlings] per year. So, there's a huge market surplus.

Case ASA (FF). Personal Interview. 9 February 2010, pp.2–3

The statement above contends Rae's (2007) conclusion, as Kirzner (1979) also argues, that short-term opportunities do exist and await discovery by the alert entrepreneur. Alert entrepreneurs with passion in agricultural activities spot and evaluate specific information received to make critical decision to proceed to the next stage of opportunity creation. This tells us that entrepreneurs pay attention to cues and to what they have learned, such as market research information, potential future opportunities and trend patterns. Passion can foster creativity and the recognition of new information patterns critical to the discovery and exploitation of promising opportunities (Baron, 2008; Sundararajan and Peters, 2007). The new information on market patterns that demands fresh pineapple fruits rather than canned

pineapple is eminent for both entrepreneurs to create business opportunities in this industry. Hence, opportunity is recognised through extracted cues such as market signals. It is evidenced from the story of Mr. Hisham who was involved in prior market research, personal observation, and formal and non-formal interaction with competitors, and so these activities provide clues to the 'location' of the profit opportunities. An opportunity can exist where there is a need or a problem, and either actual or potential demand for a product, service or experience (Rae, 2007). This may produce a new product, service creations or experience that people would find useful. This can be seen as another form of opportunity.

5.5.1.2 Prior Knowledge/Experience

Asma Agro was established by a group of entrepreneurs who had very limited knowledge and experience in agriculture, science and biotechnology. Moreover, Mr. Sabri as an incidental involvement, an unplanned venture, considered the venture. This interesting phenomenon goes against Rae's (2007) argument that previous career experience often provides the starting point for a business and employment in an industry, enabling 'niche' opportunities to be identified, networks of contacts to be built up and skills developed, as demonstrated in the contextual learning theme. Prior experience consequently confers an ability to recognise the value of new information, to learn, and to apply it to new commercial ends (Cohen & Levinthal, 1990). Experienced entrepreneurs are in this respect more likely to search for information within a more specific domain of business ideas, based on their past experiences in terms of routines and information sources that have worked well in the past (Cyert & March, 1963; Fiet, Piskounov, & Gustafsson, 2000; Shane, 2003), while novice entrepreneurs with no prior experience may have fewer benchmarks to assess whether the information they have gathered is appropriate to identify an entrepreneurial opportunity (Cooper, Folta, & Woo, 1995). In the case of Asma Agro, this notion was not applicable. It was neither the knowledge in biotech nor the technical know-how that stimulated both Mr. Hisham and Mr. Sabri into high-end pineapple and banana plantlet production. They enacted opportunities through technology acquisition, and an extracted cue that supplied them with key information that was relevant, made sense, and was convincing and logical (plausible) at that point in time. Alternatively, previous skills and experiences perhaps may hinder the business creation process and this was evidenced by the story of Mr. Sabri¹⁰; *"my legal knowledge and experience are not an advantage when it comes to Biotech's marry stem cell business. I saw that too much emphasis on the legal aspects of the business would put off my business partner."* The obstacle he views originates from his prior legal experience that

¹⁰ Mr. Sabri was working in the legal profession prior to venturing into the biotech business.

detracts others proceeding to the next stage of technology commercialisation. This stage according to Mr. Sabri requires one to be sensitive to the actual technology and how it could benefit both the technology innovator and the business partner (Asma Agro).

“Because when you are in this technology-based business, actually, people are afraid if we permanently take away their technology, permanently toy around with their technology, right? And in the protection of technology, when you go into the detail of legal mumbo jumbo – it scares them.”

Case ASA (FF). Personal Interview. 9 February 2010, p.7

Prior career and knowledge experience may also stimulate someone to critically identify potential profit opportunities available in other institutions than their own. Henceforward, alertness is seen to be the application of unique schemata that allows the entrepreneur to impute meaning to environmental change that would not be imputed by other managers (Valliere, 2011). Baumol (1993) posits on opportunity alertness (adding emphasis for biotech entrepreneurs) by indicating that it refers to innovative, non-routine activity that involves instincts, hunches, and inspiration (see also Gaglio & Katz, 2001) through the utilisation of resources (Kirzner, 1997). This is seen in the case of Asma Agro, in the issue of resource utilisation. Mr. Sabri narrated a story about the issue of inter-crop planting activities. He suggested the idea of inter-crop planting of either pineapples or bananas or even agar¹¹ (Gaharu) between two oil palm trees.

“Inter-cropping in between two oil palm trees; they could do a lot of inter-cropping. The pineapples grow between these two oil palm trees; there is a lot of it – planting among them, such as bananas and all that. Even to the extent that aloes (Gaharu) grow best even in the midst of growing oil palm trees. You just go and plant it. Plant three aloes between two oil palm trees and they grow very, very fast because they will be racing for sunlight. Things like utilisation of what is readily available.”

Case ASA (FF). Personal Interview. 9 February 2010, p.25

Mr. Sabri claims that inter-cropping activities do not exist in the government’s linked corporation plantation areas (during the time the interview was conducted) and this apparently demonstrates the lack of resource utilisation by the government-linked corporations in Malaysia.

5.5.1.3 Business Networks

Mr. Hisham shared the notion that the business network is relevant in facilitating business activities in the interview. He stressed that the personal and formal network was very important. He believed that entrepreneurs require quality products and excellent

¹¹ *Agar* is an important extract to be used in the perfume making process.

interpersonal communication skills. Consequently, Mr. Hisham set up his company's marketing strategy as the direct approach. This approach allows him and his marketing team to attend trade exhibitions to communicate their ideas and products to the market.

There have been exhibitions that we have attended and they already know about us and they keep contact directly with us to find out about our fruits. Actually, our market, the fruits – they are intended for the overseas market.

Case ASA (FF). Personal Interview. 9 February 2010, p.22

Trade exhibitions (Ellis, 2008; McAuley, 1999; Meyer & Skak 2002; Reid, 1984) have been found to be one source for information and social ties, creating the potential for entrepreneurial opportunity recognition. However, the role of exhibitions as a source of social ties is complex. According to Ellis (2000), in the context of exhibitions, the communication of opportunities cannot be uniquely attributed to a buyer, a seller, or a third party (such as a government agency). Ellis (2000) suggests that it is appropriate to treat exhibitions as a special kind of initiation scenario. In the case of Asma Agro, the initiation generates potential interactions and relationships either with new contacts or refreshing existing business contacts by providing new information and offers from the company. Hence, through business contacts from the trade exhibitions, he managed to engage with one local jelly supplier (raw material/ingredient to produce their biotech product) that offers raw materials at a reasonable and cheaper price while reducing the cost of their production.

We just recently found out that a local company produces this jelly. So, actually, networking ... and then all the while we were feeling that there were times when we felt, "Oh, we have to wait for jelly stock". We had to wait for this thing from this [foreign supplier] simply because we didn't know that we could get it locally.

Case ASA (FF). Personal Interview. 9 February 2010, p.23

Reid (1984) and McAuley (1999) found that participation in international exhibitions generated more information about international opportunities than any other information source. Trade exhibitions and similar forums where people share common interests are a context with a dense network: the proportion of potential network ties is high (Coviello 2006). One important reason for participating in networks in this way is to represent your business, and to make sure that people are aware of you and that you can find opportunities for finding and influencing prospective new clients, and other forms of relationship development (Rae, 2007). The critique of exhibition presented by Mr. Hisham was participation should be selective and thus reflects the nature of Asma Agro core business. Asma Agro he reiterates should carefully select trade exhibitions that only bring network and business values to the company. Linking to the conceptual framework, business networks through selective trade exhibitions influenced the richness and quality of the relationship to accelerate valuable

opportunities for entrepreneurs to connect to various resources/ideas/technologies. These ideas/technologies could be further up scaled into potential products/services that are of relevant to Malaysian biotech context.

5.5.2 Institutional Support Forces

Institutional support for entrepreneurs is crucial to advance the development of business activities. This is extended in several ways, such as policy development, public–private (entrepreneur) technology, and business collaboration. While globalisation has expanded the frontier of entrepreneurship, a very common type of entrepreneurship policy has focused on local interventions (Minniti, 2008). Storey (2003), for example, has identified several different types of entrepreneurship policies that are increasingly intervening at state, regional, and local level. Among the best known examples of such policies are the creation of formal and informal support mechanisms (for example, chambers of commerce and training programmes), publicly sponsored incubators, and, most of all, science, technology, and research parks (Minniti, 2008). One key area of institutional support deemed important for Asma Agro was institutional recognition. The recognition is from the award of BioNexus status enables biotech entrepreneurs to gain credibility and to construct appealing and convincing ‘stories’ for the public as well as the stakeholders in the biotech industry. Furthermore, through narrative and dialogues Mr. Hisham and Mr. Sabri were both able to construct a convincing message for their stakeholders about their business ideas. Convincing the people, in sensemaking, depicts that the idea or technology should be coherent, reasonable, and emotionally appealing to the people in order to produce socially acceptable accounts or “good stories”. So, Mr. Hisham was able to promote their success story of getting the BioNexus status recognition as something that is plausible. The process of meaning construction, in this case, can be interpreted as driven by plausibility rather than accuracy. Mr. Hisham recalls:

In the biotechnology industry, you have to convince the people that the technology works. In convincing the people, we managed to gain recognition from the Malaysia Biotech Corporation (MBC): for example, they gave us BioNexus company status. Even with this status it doesn’t mean that other institutions or other government agencies will automatically recognise you. So, you have to convince the public or stakeholders. You have to go to the public.

Case ASA (FF). Personal Interview. 9 February 2010, p.7

The empirical evidence on the effectiveness of financial support, however, is mixed (Minniti, 2008). While micro-finance schemes, according to Minniti, are usually assessed positively, other forms of financing have been criticised. Li (2002), for example, shows that credit

assistance programmes, in the form of interest subsidies, exert a strong effect on the allocation of credit to targeted entrepreneurs, but this comes at the cost of non-targeted entrepreneurs. In the Malaysian biotechnology industry context, eight out of nine cases of biotech entrepreneurs claimed that they have received some form of financial assistance or funding from either government or private institutions or both. This includes Asma Agro, and Mr. Hisham depicted the importance of institutional support in funding the entrepreneurs. He narrates how the business got help from funding institutions despite the challenge of getting through the application process.

We did receive aid from SMIDEC¹², in the early stage. MTDC is the technology acquisition. Like SMIDEC, it's for the start-up of business only. MBC provides the grant that they give to a BioNexus company. It is subject to very stringent and due diligence. They want to see legal due diligence, financial due diligence and especially technical due diligence. Because in order for a company to be, it has to be proven that the technology that they are bringing will give impact to the industry.

Case ASA (FF). Personal Interview. 9 February 2010, p.13–15

The constrains of Asma Agro at the early stage of start-up was discussed and Mr. Hisham demonstrates that it was challenging for the company to secure grants and supports from financial institutions. Nevertheless, this was a reflection of newly established company, a *liability of newness*.

5.5.3 Sociocultural Forces

Denison et al. (2004) posit that the distinct background and character of entrepreneurs led them to establish cultures that were not only rich in core values and performance-enhancing behaviours, but that also led to commercial environments conducive to learning and encouraging flexibility. Cultural values may play a role in the extent of entrepreneurial activity in a country (Bygrave & Minniti, 2000). This is evidenced in the case of Asma Agro, where the business is located in Malaysia where Islam is a widely embraced and practised religion. The socio-cultural affects of religion in entrepreneurial activities, indirectly influenced business values and belief systems. This theme was not expected in the earlier literatures and thus presented here as an emerging theme in the analysis. Mr. Hisham explains his story about the need to re-invest his efforts back into society, reflecting his Islamic faith:

What we are doing can bring income to the poor. It can bring income to the low-income farmers. It could increase the country's agriculture as a whole.

Case ASA (FF). Personal Interview. 9 February 2010, p.19

¹² SMIDEC was tasked with the role of a single agency for SMEs and its official transformation into the Small and Medium Enterprise Corporation Malaysia (SME Corp. Malaysia) commenced on 2 October 2009.

Interpreting Mr. Hisham's story, it is also pertinent in making sense of how Islam positioned entrepreneurship and entrepreneurship activities from the context defined by the Islamic source of the Holy Book of Quran¹³. This is evidenced from the encouragement and motivations for Muslims to engage in trade/entrepreneurship activities. *'Allah has permitted trade and has forbidden interest'*. *Al-Quran 2: 275*. Islam also encourages its followers to venture into business: as the Prophet Muhammad (Pbuh) expounded, nine out of ten sources of wealth (or profit opportunity) can be found in business. As Islam is a complete way of life and thus there is no separation between business and religion, Islam has its own entrepreneurship culture and guiding principles based on the Quran and the Hadith¹⁴ to manage entrepreneurship activities. The dominant influence of the Islamic belief system and entrepreneurship activities were demonstrated by Mr. Hisham's story, given below:

Looking at all the hardship of the initial efforts, I don't even know how I could get involved. But as you go on, it becomes, you know, something like a gift given by Allah (God), something that can solve the country's agriculture problems, something that can be developed. We keep on talking about it, right? And when we gain, it is thanks to Allah (God). My circle of friends is more, like, if it is relevant to the business. There's the CEO – he himself worked in an organisation, and all that. Even in terms of family, when people talk about doing business, actually doing business, it's more like people say, if you listen to them, it kills your spirit; but then, when you work on it, then you acquire – you say to yourself, this is viable, by Allah's will. This business is viable and you see your opportunity. The internal drive – having all sorts of hardship to face, and then you manage to tackle the hardship and then it grows. It grows – it will turn into a skill that we don't even realise we have acquired.

Case ASA (FF). Personal Interview. 9 February 2010, pp.8–9

Mr Hisham's statement reflects the social part of the sensemaking process, which he says is singled out and determined by social factors such as the religious belief system. Belief is the psychological state in which an individual holds a proposition or premise to be true (Schwitzgebel, 2006), appearing true, reasonable, or fair and trustworthy. Mr. Hisham reiterates, *"The business is viable, by Allah's will. And you see your opportunity. The internal drive."* Henceforward, the drive and motivation to enact opportunities are driven by socially influenced factors. Yet, this process, claims Weick (2001), never starts or stops. People simultaneously shape and react to the environments they face that are affected by their belief systems.

¹³ Al Quran is the central religious text of Islam, which Muslims consider the verbatim word of God.

¹⁴ Hadith is the record of the sayings of the Prophet Muhammad (pbuh). The sayings and conduct of the Prophet Muhammad (pbuh) constitute the Sunnah.

5.6 Conclusion

The empirical analysis reflects that family firms recognize and create opportunities using different approaches. Evidently, it is passion that influenced entrepreneurs to start new ventures, despite their limited resources. Entrepreneurs discover and create new markets, using a range of business interactions to attract the information and individuals they need to advance their business activities. The outcome of the analysis is to demonstrate that entrepreneurs combine the knowledge and skills they have acquired from formal learning and practical work experience with market research, while employing a technology that is proven. Formal education, especially in combination with relevant experience and the tacit knowledge it builds, appears to be a general determinant of success in business venturing (Vesper, 1990). Passion in business is a sensemaking action, when individuals interpret and make sense of events and situations through the lens of experience and understanding. These are evidenced in the cases of Powerbiotechnologies and AGGP, where entrepreneurs interpret key information and knowledge through the lenses of prior knowledge and experience to translate and enact business opportunities.

Entrepreneurs enact opportunities by acquiring technology, and extracting cues that supply them with information that is relevant, sensible, convincing, and logical. Through narrative and dialogue they are able to construct a convincing message for their stakeholders about their business ideas. *Convincing the people* requires that the idea or technology should be coherent, reasonable, and emotionally appealing – it must produce socially acceptable accounts or “good stories”. The drive to enact opportunities is driven by socially influenced factors and the sociocultural context. According to Weick (2001), this process is ongoing; individuals simultaneously shape and react to the environment according to their belief system. The distinct background and character of entrepreneurs lead them to establish cultures that are not only rich in core values and performance-enhancing behaviours, but are also conducive to learning and encouraging flexibility (Denison et al., 2004). Family firms make sense of personal and formal networks to connect their business and to gain access to key information and decision makers. The findings of the analysis of chapter five are summarised in Table 5.2: The Summary of Contributions of Family Funded Entrepreneurs.

**Table 5.2: The Summary of Contributions of
Family Funded Entrepreneurs**

	Powerbiotechnologies Sdn Bhd	Alor Gajah Garden Products (AGGP)	Asma Agro
Individual Forces	<p>The respondents extract cues from the supply of information gathered through trade exhibitions and enacted delivery of good service to their clients. The company's strategy was extracted from relevant cues available from the biotechnology industry. These cues influenced the entrepreneurs to spot and decide relevant and useful information in which the company secured a valuable business relationship.</p> <p>The findings pointed out that experienced entrepreneurs have acquired valuable knowledge about relevant contacts, reliable suppliers, viable markets, product availability, and competitive resources and response, which enhance their ability to spot and seize entrepreneurial opportunities.</p>	<p>Passion consists of deeply experienced positive feelings for something important to the entrepreneur and, as a result, is more enduring than the experience of episodic emotions associated with external stimuli (Wincent et al., 2008) in this case the accumulated good and bad experiences gained throughout the respondent's careers.</p> <p>The respondent discovers and creates business opportunities through the dialogues and narratives he faces in the environments in which he interacts.</p>	<p>Alert entrepreneurs with passion in agricultural activities spot and evaluate specific information received to make critical decision to proceed to the next stage of opportunity creation.</p> <p>Entrepreneurs pay attention to cues and to what they have learned, such as market research information, potential future opportunities and trend patterns. Passion can foster creativity and the recognition of new information patterns critical to the discovery and exploitation of promising opportunities.</p> <p>Opportunities are enacted through technology acquisition, and extraction of cues that supplied entrepreneurs with key information that was relevant, made sense, and was convincing and logical (plausible) at that point in time.</p> <p>The business network is relevant in facilitating business. The respondent stressed that the personal and formal network was very important.</p>

Institutional Forces	Retrospectively, using the combination of prior knowledge and skills, both from formal learning and practical work experience, and market research, the business employs a technology that is proven. Formal education, especially in combination with relevant prior experience and tacit knowledge it builds, appears to be a general determinant of success in business venturing.	The liability of newness (Stinchcomb 1965) and smallness (Baum 1996) constructs assumed that a new firm does not have sufficient resources. In addressing this issue entrepreneurs opt to resource combinations. All efforts to exploit entrepreneurial opportunities involve some innovation, because entrepreneurs' resource combinations cannot be complete and perfect replications of resource combinations used by others (Shane, 2012). The respondent formulates strategic use of external resources through inter-firm networks and informal collaborations.	One key area of institutional support deemed important was institutional recognition. The recognition through BioNexus status enables the company to gain credibility and to construct appealing positive image in the biotech industry.
Sociocultural Forces	Opportunity creation is driven by social learning process. The respondent associated the positive values he inculcated from the founder leader of the Johor Corporation. This has positively influenced the business survival of Powerbiotechnologies to discover and create business opportunities.	Sociocultural forces influenced the way individual live their lives and thus affect their activities towards opportunity. The respondent discover the current changes in trends and consumer patterns in Malaysia, thus developing the idea of bio herbs to produce and market potential products that could serve the potential demands in the community.	Cultural values influence business values and belief systems. The respondent demonstrates the need to re-invest his efforts back to the society, reflecting his Islamic faith. Henceforward, the drive and motivation to enact opportunities are driven by socially influenced factors.

The subsequent two chapters demonstrate similar analysis of study on how biotech entrepreneurs from personally funded and government's funded cases recognize and create business opportunities.

Chapter Six

Malaysian Biotechnology Case Study: Personally Funded Entrepreneurs

6.0 Introduction

The main aim of chapter six is to investigate how personally funded entrepreneurs respond to the issues of opportunity discovery and creation. This chapter analyses three biotech entrepreneurs; Orchid Life (OLF), WaferGen Biosystems (WFB) and Brass Bakti (BRB), in explaining the affect of individual forces, institutional support forces and sociocultural forces, on entrepreneurs' activities. This involves interpreting how they connects and relates with opportunity discovery and opportunity creation, presented in the conceptual framework. The analysis of the three cases are first analysed in this chapter and the background is presented in Table 6.1: Background of Personally Funded Cases.

Table 6.1: Background of Personally Funded Cases

Cases	Background	Respondents
Brass Bakti	Brass Bakti is a company that is responsible for the formulation of multipurpose spraying liquid fertiliser and basic liquid fertiliser. These fertilisers are formulated to exterminate weeds while at the same time improving the condition of the soil. The formulation of these fertilisers consists of biotechnological processes. TD and BASAL 2000 fertilisers are Brass Bakti's two main products. The company has now also gone international, selling to Bangladesh and Indonesia.	Haji Ahmad Mr. Rahman
WaferGen Biosystem	Led by a team of experienced professionals and collaborating with leading research institutes, WaferGen Biosystems Sdn Bhd leads in the development, manufacture and sale of state-of-the-art products for genomic analysis for the life science and pharmaceutical industries. The star product of WaferGen Biosystems is the Smart Chip Real-time System for the identification and validation of biomarkers. This product started to be produced commercially in early 2010, together with the Smart Chip Gene Expression Profiling Services, an increasingly important tool in the area of drug development. The major customers of WaferGen include universities and service providers.	Mr. Nazri
Orchid Life	Another BioNexus status company is Orchid Life Sdn Bhd. Formed in 2007, this company is a spin-off company of the Universiti Putra Malaysia and is involved in horticultural products, mainly in innovative research and development of plant genomics, micro-propagation and breeding through the adoption of biotechnology and high-tech molecular processes. The four main areas of focus of this company are plant tissue culture and genetic transformation, plant molecular and developmental biology, plant genomics, and bioinformatics. Mr. Razak was the CEO of Orchid Life at the time of the interview.	Mr. Razak

6.1 Case 1: Brass Bakti

6.1.1 Individual Forces

6.1.1.1 Passion

Haji Ahmad and Mr. Rahman are long-time friends. Haji Ahmad started his career in the government agriculture department as a researcher working in various states in Malaysia, dealing with research and advisory roles for the agricultural sectors. During the last 10 years of a total of 30 years' experience in the agricultural sector, Haji Ahmad decided to plan to do something more challenging for his post-retirement activities. At any given moment, a person has one raw feeling, such as happiness or tiredness (Cardon et al, 2005). This in the case of Mr. Rahman and Haji Ahmad was reflected from their working history prior to the business venture. This feeling is consciously accessible to the person experiencing it, meaning they are aware of that affect, but it exists without any cognitive processing or reflection (Zajonc, 2000), such as determining why one is happy or tired. Such feeling may exist to one who was tasked to repeatedly to do the same activities for most of their career history. In the case of Brass Bakti, passion influences Mr. Rahman strength and courage (Bierly et al., 2000) and mobilizing energy (Brannback, Carsrud, Elfving, & Krueger, 2006) and technical expertise of his partner, Haji Rahman to form business partnership while unflagging pursuit of challenging goals (Smilor, 1997) in the bio- fertiliser business.

Passion has also influenced Mr. Rahman to apply for early retirement and opted to leave the government to start Brass Bakti business venture. The interview with Mr. Rahman revealed that his involvement in business was inspired by his passion and love for business and thus he focuses on activities in which he invests time and energy and that he finds important (Vallerand et al., 2003), which is the bio-fertiliser business. The ability of Mr. Rahman to recombine resources of him in marketing and sales and Haji Ahmad in agricultural biotechnology was also amazing and thus advancing his action to the next level of opportunity creation by building a strong foundation of resources.

6.1.1.2 Prior Knowledge/Experience

Mr. Rahman recalled his passion and involvement in selling and developing land prior to setting up Brass Bakti. He reiterates that his past career activities enhance his skills, particularly in the area of marketing sales. Nevertheless, Mr. Rahman participates in various courses including marketing, entrepreneurship, psychology and customer services, in which

he claims, *"to make use of the opportunities"*. The interview session with him revealed that he was always alert to engage with courses that could increase his knowledge and understanding in certain areas that he was not familiar with. So, in sensemaking this was an ongoing learning process and hence a process that never stopped. Frijda (2005) suggests that passion is activated by emotionally important goals that control and guide desires, thoughts, plans, and behaviours and that persist over time, regardless of costs, external obstacles, and moral objections. In short, Mr. Rahman was attracted into business by passion and motivation. He also asserts the drive for his business venture: *"the motivation came from within me. That is the major factor, because I had the desire to be an entrepreneur. I am truly interested in that field."* People who start a business with positive motivation are more likely to succeed than people who start a business with negative motivation (Storey, 1994). Passion fuels Mr. Rahman's drive to take the risk of venturing into something new despite having a stable career with the government. He shares his passion and motivation in business:

I love doing business. I co-operated with other people during that time I was also doing business. Back when I was working with the government [laughing] I sold land. I developed land. Land deals – they are associated with grants. I have also taken out sand and all that. So I had fun. I have skills in that field; my experience is in that field (such as) developing land. Developing land into agricultural land or into residential land or into industrial land.

Case BRB (PF). Personal Interview. 5 February 2010, p.1

In Mr. Rahman's case, he involved himself in different types of entrepreneurial activities such as selling and developing land. The sales activities posit a social interaction role that influenced his identity. Mr. Rahman was a retired government servant and is currently an entrepreneur. And people also develop their identity from their activities, practices and roles in social interactions (Rae, 2007). Weick (2001) views identity as a crucial ingredient of the sensemaking process. This is a process in which both partners, Haji Ahmad and Mr. Rahman, demonstrate a notion that defines their business identity on risk and their interactions with other business communities.

People do say that nine-tenths of wealth comes from business but we have to understand that the risk makes up nine-tenths of the business too. Only one-tenth would be the easy part. The other nine-tenths make up the risks and other uncertainties. But the reward/wealth is also nine-tenths, if you compare it with those on the payroll. I love watching the Chinese do business. Sometimes they would say, "You don't be afraid, I support you! As long as you take care of your payments you are good."

Case BRB (PF). Personal Interview. 5 February 2010, p.3

From the story above, Mr. Rahman demonstrates a strong identity. Entrepreneurs often explain their actions and decisions in terms of their identities ("what kind of person I am")

rather than their goals or preferences (“what I want and like”) (Read et al., 2011). Mr. Rahman recalls his views; *“Our own self, we have to know. This means we have to first put forward [in our mind] what we want to be. Actually, in business, you cannot simply imitate others.”* The interesting part of Mr. Rahman’s career journey was when he made a risky decision to retire early from the government before the acceptable age of retirement¹⁵. The decision he made came with the hefty cost of no monthly pension and a penalty of one month’s salary for his resignation. He made a plausible and fast decision; he says: *“I wanted to quit quickly as I wanted to grab this one business opportunity.”* So, how could Mr. Rahman be so sure that the opportunity existed that he was convinced to make a career move from a stable paid job into a challenging biotech venture? He further claims that his entrepreneurial decision was made from what he learned from extracted cues from the Chinese businesses, and they helped him to decide what information was relevant and what explanations were acceptable. The theoretical framework in this thesis suggests that, entrepreneur (Mr. Rahman) believe that from these cues he took action, because he believed that he was able to make sense of his schematic ideas, and utilises his vast resources of business networks into potential business opportunities.

6.1.1.3 Business Networks

Sweeney (1987) posit that networking is especially important in technological venturing and it is eminent for biotech ventures to create and maintain their key individuals and networks such as customers, suppliers, investors, lenders, government agencies, regulatory bodies and others. To develop and maintain the key individuals and networks, Brass Bakti employs a media communication strategy. The company uses newspaper media advertising to communicate the idea of “3-in-1” biotechnology liquid fertiliser to the public, potential agents and institutional buyers. Despite being a new firm, Brass Bakti was successful in communicating their products and attracting business leads and securing valuable access from FAMA¹⁶ (the Malaysian Federal Agriculture Marketing Authority). While Mr. Rahman and Haji Ahmad both utilised their business networks to increase competitive advantage and to penetrate bigger market shares locally and abroad. It was logical and plausible for Haji Ahmad to ride on his partner’s sales and marketing skills while his partner, Mr. Rahman, enjoyed his technical expertise in biotechnology. In recognising business opportunities, every person is in the epicentre of their own personal network. Entrepreneurs have an

¹⁵ The generally acceptable age of retirement for government officers in Malaysia is 40 and one needs to serve for a minimum of 10 years in order to qualify for a pension.

¹⁶ An agency with various marketing roles, including helping to facilitate Malaysian farmers to promote their products through the FAMA daily markets.

egocentric network (Johanisson, 1998) and this network consists of all direct and indirect links that give them access to different segments of the environment. The entrepreneur is also a member of different collective networks based on, for example, profession, trade, or location (p.299).

Mr. Rahman acknowledges his role in attracting business suppliers and maintaining harmonious social interactions with them. He shares his views on this issue: “When we do business, we will have relationship with other people in terms of the supplier, the one who supplies to us.” From the sensemaking perspective, the action was an ongoing social interaction process between two parties with different aims and objectives. Individuals may deliberately create opportunities, but often opportunities are the unintended outcomes of activities motivated by other objectives (Buenstorf, 2007). The rule of the game has been clearly set by Mr. Rahman – to gain benefit out of the relationship, one needs to demonstrate business discipline, the discipline to engage in business with trust and honesty. For Mr. Rahman, the relationships make sense to him and his business partners, either with intended or unintended outcomes.

So, here we have to show our discipline, right? Our good relationship with them. If we could show a good relationship, the supplier would even supply to us on credit for a long period of time, even when the transaction should have been cash on delivery.

Case BRB (PF). Personal Interview. 5 February 2010, p.12

6.1.2 Institutional Support Forces

Minniti (2008), claims that to promote an environment conducive to productive entrepreneurship, a government should also consider effective implementation of legislation such as the enforcement of laws and regulations. However, government initiatives to increase entrepreneurial activity often do not seem to be informed or welcomed by entrepreneurs themselves, and there is an absence of dialogue in the top-down relationship between government and entrepreneurs, for example in the way in which small business support programmes are constantly changed by governments (Rae, 2007). In Malaysia’s biotechnology context, this perhaps attracts conflict among entrepreneurs despite the solid existence of the biotechnology effort through the National Biotechnology Policy. The case of Brass Bakti demonstrates a lack of legal and regulatory enforcements from the authorities, hence affecting businesses that want to create more business opportunities. Mr. Rahman recalls the issue of pesticide enforcements in the agricultural sector in Malaysia. Though banned by the government, the pesticide Paraquat is still widely used by farmers in Malaysia. Mr. Rahman therefore shares similar concerns with Dr. Nasir and Mr. Omar of

Powerbiotechnologies about the deficiency of legislation enforcement. Regardless of having a great biotechnology policy on paper, Mr. Rahman could see the Malaysian government's failure on regulatory enforcement matters. He narrated the issue of enforcement of pesticide regulations in the agricultural sector.

How many of us are aware that these pesticides [and herbicides] are detrimental to our health, or to animals or the environment? People are not too concerned about it. So, here I feel that the government has to do something about it. Create law enforcement and stress on this matter. I have seen people, after they've sprayed herbicides on the weeds, eating them. They still keep on using them. Sometimes, it would affect the farmer's health, but they keep using them. Sometimes not for killing weeds, but they also use them to ensure their vegetables' freshness – the pesticides.

Case BRB (PF). Personal Interview. 5 February 2010, p.4

So, it may be conflicting and frustrating for enterprising individuals in the biotechnology industry who hear encouraging messages from government leaders and agencies, but who encounter practical difficulties in gaining access to the resources and opportunities and who experience a lack of regulatory enforcement that detracts from business interests. Although viewing the Malaysian government critically, Mr. Rahman acknowledged the government's intervention/support through institutional funding. Brass Bakti secured a match funding from SMIDEC (Small and Medium Industries Development Corporation) to purchase machines and lab equipments. Mr. Rahman realised that the combination of the skills and prior knowledge and Brass Bakti's genuine business model facilitated the grant application process, which took only two months to be processed. He utilises his skills and prior knowledge to understand the mechanism of the loan application and disbursement process. Though the process may not be officially taught, Mr. Rahman engages with social interactions, allowing him to extract cues from valuable business contacts. Mr. Rahman and Haji Ahmad pioneered close collaborative relationships with several institutions including the Technical University of Malaysia, Melaka (UTeM), and SMIDEC to boost technological developments in fertiliser production that use advanced manufacturing technology. Moreover, these collaborations engage UTeM academics and Brass Bakti in a technical and soft skills collaborative relationship. The cues from interactions of these relationships enable Mr. Rahman and his partner to make valuable decisions based on the available information and then facilitate the loan application process. The case of Brass Bakti supports Johannisson's (1998) argument that proximity to the university and local networking facilitated a combined academic and business career and a smooth venturing process. Mr. Rahman shares his story on how he dealt with the process of loan application that opened bigger windows of business opportunities for his venture.

The entrepreneur himself – so, if we have all the papers prepared, then there wouldn't be any problem. The problem arising now is not from SMIDEC, you know. It's the entrepreneurs themselves. He [entrepreneur] wants to apply for a grant facility, but he didn't have his papers ready; the documentation to be processed – there was none. But during my time [applying] – I am not trying to boast or anything, but I had everything ready. So it was easy and fast. I was one of the few that were getting the grant in a short period of time. It was fast; I went to submit my documentation, and got the grant after two months. Ah, that was it; that the business is true, that we need the machines because we want to operate our business, to manufacture our product. So, we are entitled to receive the facility without having to show anything else, right? Sometimes there is – but there was also a case where the factory didn't even exist, but that was then. Now SMIDEC has smartened up you know [laughs]. SMIDEC would go and pay a visit, you know. They would visit the office, the company, the factory, to see if it is real or not, you know. If a person were establishing a fertiliser company, they would check if there really is fertiliser being produced.

Case BRB (PF). Personal Interview. 5 February 2010, pp.21–22

Interpreting Mr. Rahman's message is to communicate to the various actors in the biotech business that Brass Bakti is a company that has sound business model. This advanced the process of institutional help and locates the firm in better position to spot financial opportunities.

6.1.3 Sociocultural Forces

Learning is part of the sociocultural process. Learning is of increasing importance in technology-based enterprises, given the growing significance of science and technology innovation in new venture creation¹⁷. Biotechnology, as one of the new areas of business attracting billion dollar investments in Malaysia, demands entrepreneurs for a new learning paradigm. Jack and Anderson (1999) suggest that entrepreneurial learning can be enriched through, for example, role models, personal networks and apprenticeships with small firms. This was much spoken about and discussed in the interview with Mr. Rahman. He was enthusiastic to connect and elaborate more on how important learning is to him and his business. Nevertheless, learning for him was not merely a formal process but it enriched his life and his entrepreneurship venture. Mr. Rahman recalls his views:

Actually, there are so many things that we can learn, for me, right. I mean, in life, entrepreneurship matures our life, because in entrepreneurship, in business, we would face a lot of challenges and all that. We would face a lot of hardships, a lot of challenges, a lot of wealth/comfort and so much more. So all are there, if we want to say, the bitter, sweet, sour – all are there in doing business.

Case BRB (PF). Personal Interview. 5 February 2010, p.14

Mr. Rahman demonstrates and connects from his messages the interplay of personal enrichment during the journey of creating business opportunities. Nevertheless, his identity

¹⁷ Department of Trade and Industry, Innovation report: competing in the global economy: the innovation challenge, 2003

and personality is shaped by what he and his partners experienced during this journey. Mr. Rahman stressed the need to define the meaning of the entrepreneur's existence in business. He says, "So the utmost important thing is for us to ask ourselves what is it that we want to gain from doing business." In this Mr. Rahman suggests:

I feel that by getting involved in business, we can meet people aside from doing the business as a form of service, right? Business is one form of service, right? One form of service, meaning that, we give our service to people. So, we have to put it in our heart, that we're helping people. I really feel satisfied and happy that we could help people. All this while, people want things from me, people want to buy my fertiliser, and there are those who want to buy pesticides, buy lime to solve their farm problems. But with this one product from us, we could [help solve their problems]. I feel satisfied, I enjoy [helping].

Case BRB (PF). Personal Interview. 5 February 2010, p. 15

Mr. Rahman's view above was interpreted in sensemaking as a social process in which what he says was identified and conclusions were determined by social factors, connecting him with society, helping the people in need of his services. Mr. Rahman felt that providing a service through his bio-fertiliser products was part of his commitment to contributing to be part of the solution for issues faced within the agricultural society. It is in part his friendship with Haji Rahman that impacted his views and values towards the universe and society. Although seemingly intangible, people are powerfully impacted by informal cues from peers and managers, which Hofstede believed were manifested in symbols, heroes, rituals, and values (Denison et al., 2004). Religion, here, supplies one with a logical and convincing meaning about certain notions. Mr. Rahman, Haji Ahmad and perhaps the Muslims may share the view that our share of wealth is given by Allah (God). Mr. Rahman narrated carefully his views:

We have to have faith. Our share of wealth is given by Allah (God), right? That is how I see it. Actually the motivation came from within my own self. That is the major factor, because I had the desire to be an entrepreneur. Internally – I am truly interested in that field. People do say that nine-tenths of wealth comes from business but we have to understand that the risk makes up nine-tenths of the business too. Only one-tenth would be the easy part. One-tenth is the easy part. The other nine-tenths make up the risks and other uncertainties. But the reward/wealth is also nine-tenths, if you compare it with those on the payroll. So, that is like that. But, I think, what motivates me a lot is my success. We have to remember: when it comes to money/financial issues, we have to have faith in Allah (God); it's *rezeki* (sustenance). Some people are not involved in business and yet they become rich too. So, why should they bother putting themselves in the business line, right? Chasing this and that, having to do this and that, right? But we could see that there are people that are not in business and yet they get money. That is why, in the money issue, we cannot think that we get more wealth because we do business. Some people – they do business but it didn't work out, right? It didn't work out. So, all this '*rezeki*' matters come from Allah SWT (God).

Case BRB (PF). Personal Interview. 5 February 2010, p. 13 & 15

Identity consists of having a strong affinity for particular ways of living and deciding, rather than for any particular consequences (Read et al., 2011). Identity is also shaped by one's background and experiences. As a Muslim, Mr. Rahman views entrepreneurship as part of Islamic practices, in which the entrepreneur should aim to search for God's blessings above all other aims. Consequently, he posits that business is never for the profit opportunity alone, that it should be treated as '*Ibadah*' or worship. Mr. Rahman's perspective complements Bygrave & Minniti's (2000) notion that cultural values may play a role in the extent of entrepreneurial activity in a country. Hence, this further explains Mr. Rahman's views and identity about the meaning of business success that promotes a process-based approach (means and ways of achieving it as determined by Islamic religion) rather than measuring it by the end result. His views on the role of entrepreneurs was extracted from cues of his religious belief system that attracts a better understanding to address the issue addressed by Korten (2009). Korten stresses that we have for too long put up with an economic system that is designed to make money for rich people and maintain them in a condition of obscene excess, while confining billions to desperation and reducing the earth to a toxic waste dump. This emerging theme connects the role of beliefs, identity of entrepreneurs within the bigger frame of the influence of socio-cultural forces on opportunity creation.

6.2 Case 2: WaferGen Biosystems

6.2.1 Individual Forces

6.2.1.1 Passion

A CEO, Mr. Nazri, heads WaferGen Biosystems, Malaysia. He made a critical decision in his career to leave a comfortable career in a successful and profitable manufacturing company to later embark on a business venture, and this explains his identity profile. He left a stable career to start up a new technology gene expression business during the period of 1996 to 1999, when Malaysia was in global economic crisis, and so his decision reflects a risk taker identity. Meanwhile, in contrast to traditional work contexts, where individuals were concerned with the success of the firm as jobs were protected, biotech entrepreneurs are now more likely to be concerned with their career, and their ability to grasp opportunities and explore new domains (Touraine, 2007: p.64). This perhaps explains Mr. Nazri's competency to capture cues from several actors in the biotechnology industry to help him decide what information is relevant and what explanations are acceptable prior to making critical business decisions. He was successful in presenting a convincing and logical case (plausible) to his friend Alnoor Shivji of the United States, persuading him to invest in

Malaysia, historically a new biotechnology player. Mr. Nazri's behaviour demonstrates a strong motivational character that attracted (pulled) him into the biotechnology business start-up despite knowing the existing and future challenges in this area.

Shapero (1975) proposed push and pull factors to explain entrepreneurial motivations. Voluntary action derived from Mr. Nazri's passion and wants makes the pull factors superior to the push factors in the effort to explain his entrepreneurial motivation. Mr. Nazri recalls, "I enjoy working. Sometimes people want to go and do their own hobby." Brannback et al., posit "passion can fuel motivation, enhance mental activity, and provide meaning to everyday work" (2006:3). This perhaps explicates the notion of social psychologists involved in the more recent study of passion, who emphasise its conscious experience, motivational quality, and identity meaning (Cardon et. al. 2005). Despite the pull factor, Mr. Nazri was faced with an identity dilemma. He was in a very difficult situation, needing to make clear to his wife, peers and friends his action in creating WaferGen when the people surrounding him knew very well his inadequate knowledge of gene expression technology. This could be interpreted from Mr. Nazri's story:

Of course they questioned, "You sure you want to leave the company and you sure WaferGen is the – You know them well?" I said, "I am not sure." But then, when I made some friends in the industrial committee, they were all like – there's one term, which I never consider. There's one friend of mine who asked me, "Nazri, do you have a parachute term?" I said, "What is this parachute term?" Uh, 'parachute deal', they call it. They said we should deal for a 6-month salary if the project did not materialise. I said, I never thought of that.

Case WFB (PF). Personal Interview. 8 March 2010, p.9

However, dysfunctional effects of passion, such as obsession and discounting negative information (Branzei & Zietsma, 2003), are thought to interfere with entrepreneurial effectiveness. This, only realized by Mr. Nazri when his friend probe him on the 'parachute deal' if the project failed to materialized. Dutton and colleagues (2010) outline that work continues to be a key source of meaning in life and indicate that identities are frequently formed and transformed in work contexts. In the context of Mr. Nazri, he enters new roles, and a process of identity negotiation, i.e. identity work, commences (Goffman, 1959; Ibarra, 1999). Thus the career transition for Mr. Nazri from being a manufacturing employee to running a biotech start-up venture provides scope for him to reconstruct his identity, and requires him to renegotiate the private and public views of himself and the current environment. With different sets of prior knowledge and experience, Mr. Nazri presents a disparate pattern of behaviour affecting his identity, supporting Shane's (2000) results confirming theoretical speculation (Ardichvili et al., 2003; Hayek, 1945; Venkataraman, 1997) that different types of prior knowledge will affect the manner in which one identifies opportunities.

6.2.1.2 Prior Knowledge/Experience

Shane (2000) shows that an individual's knowledge about existing markets, how to serve those markets, and about customers' problems will influence the opportunities one discovers. This relates to Mr. Nazri's prior knowledge and affects his involvement in the business of developing a genetic analysis instrument. He posits that WaferGen's technology is a synergy of two areas: biotechnology and the manufacturing of analysis instruments. Looking at his experience retrospectively, Mr. Nazri interprets and analyses biotech business situations through the lens of his past years of work in the semiconductor manufacturing company. His interactions through dialogues and narratives have led him into various activities that are considered as profitable. It was during that time that Mr. Nazri met and managed to convince Alnoor Shivji to invest in the biotechnology business in Malaysia. Mr. Nazri recalls his experiences:

In my previous company, Semicon Manufacturing, I spent about ten years, more than ten years, though I had an opportunity then to do start-up. I was involved mainly in the real scratch work, giving me bare land [and] working with the architects, designing the factory, designing the plan, procuring facilities; procurement of whatever. Putting the infrastructure in place. I have one – of course I have one so-called 'thought' in my mind that one day I could possibly run my own business. I was in engineering; I was all the time in manufacturing. So, in 2005, I was introduced to the founder of WaferGen. I got to know him and he asked me to set up [a business] for him. I told him I am not from a biotech background. He said, "Doesn't matter. All I need is someone who can set up the company." So, we bought a two-dollar company, setting up the facilities, appointing lawyers, appointing company secretaries, opening up account; all those basic things of setting up companies.

Case WFB (PF). Personal Interview. 8 March 2010, p.7–8

It was during this period that Mr. Nazri then developed his identity in practice as an entrepreneur. It was the period in which he discovered from experience what he was good at, through education, hobbies or interests, and finding and gaining confidence in natural talents and abilities, and then learning how these could be applied and be of value within networks of social relationships and situations (Rae, 2007). Mr. Nazri's notion of prior knowledge and experience supports other studies that suggest prior management experience increases an individual's intention to start a new venture, thereby facilitating the opportunity recognition process (Delmar & Davidsson, 2000; Honig & Davidsson, 2000). General management experience seems to provide individuals with information about many of the basic aspects of business that are relevant for recognising and acting on entrepreneurial opportunities, such as finance, sales, technology, logistics, marketing, and organisation (Romanelli & Schoonhoven, 2001; Shepherd et al., 2000). Moreover, having prior management experience provides entrepreneurs with training in many of the skills needed for coping with the liabilities of newness, such as selling, negotiating, leading,

planning, decision making, problem solving, organising, and communicating (Lorrain & Dussault, 1988; Shane, 2003). With limited knowledge of biotechnology, Mr. Nazri extracted cues from dialogues and interactions during his visit to his former professor at the Genome Centre, University of Science, Malaysia. Hence, he felt that the outcome of the meeting was plausible, the technology was convincing, and it fitted well with his business idea. The visit was crucial to Mr. Nazri: through dialogues and narratives with the professor, he makes sense of the opportunity to engage in genomic analysis for the life science and pharmaceutical industries. He shares his story:

So, like wondering, what? Why are they all excited? I didn't understand at the time. Then, one of the professors said to me, "Eh, Nazri, where did you get this?" I said, "I don't know. He's now telling me about his technology and he said, "You are excited?" "Yeah," I said. "This is what we need." The country needs this kind of technology. I said, "OK." From then on, I keep on studying, looking into it and then; we tended to believe in it. This technology is going to be the breakthrough and probably – I would say that is a killer application with regard to gene expression.

Case WFB (PF). Personal Interview. 8 March 2010, pp.7–8

6.2.1.3 Business Networks

Ozgen and Baron (2007) claims that three social sources of opportunity-related information (mentors, informal industry networks, participation in professional forums) had direct, positive effects on opportunity recognition by entrepreneurs. The study claimed that the greater the extent to which entrepreneurs had mentors and informal industry networks, and participated in professional forums, the greater their alertness to new business opportunities. In the case of WaferGen, Mr. Nazri socialized with his clients, suppliers, and present and former colleagues. The interactions between these actors helped him to consider various options and valuable information, leading in turn to identifying and enacting business opportunities. The key idea for engaging in business networks is finding common interests and later benefitting from such relationships by securing important and critical key contacts and valuable sources of information, as happened with Mr. Nazri's business. This can only make sense among the actors if there are effective and productive dialogues in the communication process. Mr. Nazri explains,

Whereas if you talk about manufacturing, if you want to manufacture systems, I have my own strength in networking with all the suppliers, vendors, and manufacturing companies that deal with instrument manufacturing.

Case WFB (PF). Personal Interview. 8 March 2010, p.30

Mr. Nazri has more than 15 years of work experience, ranging from government to banking and from manufacturing into start-up consultancy. He demonstrates the ability to create

larger social networks, and the larger the entrepreneurs' social networks, the more opportunities they recognise (Singh et al. 1999). In spite of working in different types of industries from services to manufacturing, Mr. Nazri displays broader entrepreneurial social and informal networks. This is consistent with the notion of Johansson (2000), that the broader the entrepreneurs' informal networks, the more likely they are to gather relevant information. Individuals, especially those in scientific or technical fields, often seek information about current developments in their field through more formal channels than their industry networks (Bhave, 1994). This is also present in the context of the biotechnology industry and is evidenced in the interview where Mr. Nazri sought advice and help from his former professor in the Malaysian Genomic Resource Centre, a centre that has much in common with and to offer to his business venture.

Moreover, a lot of the literature in the field of social psychology suggests that other people are often a very important source of information (Baron et al., 2005). For one to unleash the valuable source of information, one needs to interact with and interpret valuable cues from the other people. In sensemaking and business contexts, Mr. Nazri searches for meaning, presenting coherent, reasonable and emotionally appealing good stories about his business/technology/products that are acceptable to the potential clients/customers/networks. Because entrepreneurs do not simply arbitrage—buying resources at one time or place and selling them at another—but recombine resources, entrepreneurial decision-making involves making judgments of the future value of resources if they are recombined (Shane, 2012). Here, as an entrepreneur, Mr. Nazri recombine various available resources and mobilising his personal business contacts through the company's funders and advisors such as the MBC and the Scientific Advisory Board (SAB). These two institutions are key stakeholders financially supporting his business, while SAB also serves in an advisory role to the company. Mr. Nazri reflects his view below:

It's very much into personal contact – like one of our directors is Zahir [who] was my personal friend. He is my personal friend. He is in life sciences. Back a bit to the story of setting up our company, when my chairman said to me, "OK, Nazri, you can set up a company." In Malaysia you need two people to set up a Sendirian Berhad (private limited) company. So I told myself, "I can't be getting my wife into it. This is not a personal company." Then I remembered I had a friend, Zahir, and I said, "Eh, Zahir, can you please be my director for a while?" And he said, "OK." But, at least he has a life sciences background, life sciences exposure. He knows what this topic is all about. So he provides a network to the Malaysia Genome Institute (a network-based not-for-profit organisation undertaking basic research aimed at the generation of new intellectual properties and technologies for economic development via large-scale national and international collaborative projects in genomics, genetics, and metabolic engineering, etc.). He has his own network. In fact,

tomorrow we are supposed to go and see a company in Perlis¹⁸ dealing with rice. You know rice seedlings, the seeds? And then, next week we are going to see a company they call the Malaysian Genome Resource Centre.

Case WFB (PF). Personal Interview. 8 March 2010, p.28

While, the act of Mr. Nazri may not seem to be fundamentally different from other entrepreneurs, all efforts to exploit entrepreneurial opportunities involve some innovation, because entrepreneurs' resource combinations cannot be complete and perfect replications of resource combinations used by others (Shane, 2012). This was transpired in Mr. Nazri's effort to connect and manage effectively the resources available to him to facilitate the process of opportunity creation. Additionally, as a company operating in Malaysia, WaferGen seeks to acquire supports from institutional actors.

6.2.2 Institutional Support Forces

As a company in which 51 per cent of the shares are still owned by the American investors, WaferGen requires strong business networks to financially sustain it in Malaysia. Technically, WaferGen is a foreign-owned company and hence it will be challenging for the company to get any grants or soft loans from government institutions. Mr. Nazri's role was eminent. Through the interviews and dialogues, he demonstrates a mentally alert behaviour and utilises his relationship with MBC and SAB to gain access to valuable key individuals and decisions to facilitate his business. During the interview session, Mr. Nazri recalled his plan to create sensible benefits from the SAB board experts, hence leveraging on their vast business connections particularly in the area of life sciences and genome businesses. Through Mr. Nazri's network engagement, WaferGen secured more than US\$2 million of funding during the period between 1996 and 1999 when most countries were faced with a financial crisis. He shares his experience:

We raise our funds through venture capital funding. We have got US\$2 million from MTDC [Malaysian Technology Development Corporation]. We have got US\$1 million from Komatsu side ventures and about half a million (US\$) from equity and expedient equity ventures, and about US\$423,000 from Modal Perdana. (It's a way of life). So, it's about almost US\$4 million from local venture capital.

Case WFB (PF). Personal Interview. 8 March 2010, p.6

Read et al. (2011) posit that entrepreneurs often explain their actions and decisions in terms of their identities ("what kind of person I am") rather than their goals or preferences ("what I want and like"). From the interview conversations, Mr. Nazri presents the achievement that signifies "what kind of person I am", by developing social and emotional acceptance among

¹⁸ A state located in the northern part of Malaysia, bordering Thailand.

friends, peers, customers and suppliers during his banking and manufacturing days through trust. The trust he gained allows him support from others, such as the supplier/contractor, enabling him to construct his biotech laboratory at a cost of up to RM70000 without any financial guarantee or deposit required. This demonstrates that entrepreneurs in general appear to realise the value of creating and sustaining strong identities (such as trust), which are helpful in the face of great uncertainty, when it is not otherwise clear what they should do (Read et al., 2011). The institutional support from the other actors, gained through a strong business identity of trust, helps Mr. Nazri's business in addressing the issue of a lack of financial resources.

I think what the entrepreneur or professionals need is networking – good networking and trust. So the point that I am getting at is actually, how my ex-bank, my ex-employer give me (funds and other assistance) because I was working there. So, they are a network, definitely. You know them, they know you. I am not a person who hanky-pankys around so whenever you ask for support, they support. I told them, "This project, if it didn't materialise?" "Hopefully it will," the contractor said. "If it doesn't materialise, then it's burned". When I do renovation for this place, I buy all this equipment [with] no deposits down. (The deposit) is the trust. Finally the contractor did the renovation job. Not much, about RM50, 000–70,000 we think. But the fact is that they – they don't request any deposit.

Case WFB (PF). Personal Interview. 8 March 2010, pp.12 & 36

Reflecting on the above story, trust is one form of resources to address Wafergen's limitation of securing financial supports. As a new and still unknown, the firm requires strong case to attract collaborators and funders. Hence, Wafergen's survival is very much influenced by the strong identity and the trust developed by Mr. Nazri during those years of employment. The limitation of Wafergen is also shaped by the institutional support and interventions by the government through laws, policy and regulations. The government provides security through regulatory powers, hence providing a guarantee to such collaborative relationships. WaferGen, for example, has established a relationship with the Universities of Pittsburgh and Texas, both in the United States (US), to run their prototype system into real life working conditions, through the spirit of the Malaysia National Biotechnology Policy. The policy facilitates the process of starting and engaging business firms with other important and reputable institutions, for instance the universities and research institutions. Such an engagement for a new business venture such as WaferGen helps the firm to address the problem of liability of newness (Stinchcomb, 1965) and liability of smallness (Baum, 1996).

They got the grant (the University of Pittsburgh and University of Texas, in the United States). What happened in the US is that Pittsburgh – they have a grant from NIH, the National Institute of Health. So with that grant, they use our technology to run our PCR (polymerase chain reaction) system and through that they do research work. The research work is using our own system.

Case WFB (PF). Personal Interview. 8 March 2010, p.25

Mr. Nazri regarded the success of such collaboration, together with the powerful media role in promoting biotechnology, as the next engine of growth for Malaysia. The Malaysian government positioned the biotechnology industry as the new area of growth for the country, through media advertising locally and abroad. Mr. Nazri reiterates that the promotion of Malaysian biotechnology capability gained global attention and thus attracted international investors, including Alnoor from the US. Such positive news attracts many to look at Malaysia as a country for investment, rather than India and Singapore. Mr. Nazri recalls Alnoor's earlier involvement in a biotech business venture in Malaysia:

I just happened to meet up with Alnoor, the founder, and he likes Malaysia to start with because of the Malaysian initiative to promote biotech.

Case WFB (PF). Personal Interview. 8 March 2010, p.16

Minniti (2008) claims that when it comes to entrepreneurship policy, one size does not fit all, and that, in the long run, governments can only provide an underlying environment conducive to the emergence of productive rather than unproductive entrepreneurship. So, entrepreneurs' ability to recognise and create opportunity relies on their alertness to extract cues from the business environment. For example, Mr. Nazri engages in several dialogues and narratives with players in the business community to assess and evaluate potential institutional demands for his technology and products. From the dialogues and market cues, he recalls there was an abundance of demand in the area of smart chip technology in Malaysia:

We are looking for our technology to be used in palm oil and fisheries, MARDI {Malaysian Agricultural Research and Development Institute}, is a government body in Malaysia under the Ministry of Agriculture and Agro-Based Industry (MOA) dealing with rice. There are opportunities to work with these people using our system to develop the gene panels. We talked to the Malaysian Palm Oil Board (MPOB). They are screening genes and they want to develop new genes, for example, for a palm oil tree. Could be some collaboration we are trying to do, even in fisheries.

Case WFB (PF). Personal Interview. 8 March 2010, p.18

Mr. Nazri spotted potential signs of opportunities during these interactions and later noticed that these signs were potential to his business. The market cues from the potential signs should not be interpreted literally as sign of business opportunities thus should be re-framed into bridging the business/firms and the characteristics of opportunities available within the environment.

6.2.3 Sociocultural Forces

Minniti (2008) suggests that government should endeavour to create enabling environments conducive to the division of labour, the commercialisation of invention, and exchange, as too much public involvement, without co-interest from the private sector, can hinder rather than help entrepreneurs by creating possible market distortions. Creating an enabling environment through regulatory enforcement is crucial for entrepreneurs, and the interview with Mr. Nazri demonstrates this. Diseases such as TB¹⁹ and leprosy were both quite unknown before, yet are quite common nowadays. Mr. Nazri claims that these problems and issues help him and his business to offer immediate solutions and WaferGen's technology is part of the solution. He claims that the technology enhances the process of health check screening at Malaysia's border entry points. The smart chip technology of gene expression, according to Mr. Nazri, helps to address the loophole in the health screening process at all Malaysia's entry points. This is made possible through immediate and accurate health test results while allowing a faster processing period and reduced waiting time. Therefore, problems drive one to come out with a creative solution in one way or another, making sense for opportunity enactment.

We see the potential of using our systems at entry points with regards to foreign workers coming in, using our technology. Currently TB is on the rise and with the case of Vietnamese [and] Myanmar people coming in – so our instrument can do the analysis as well. From the sample we can do an analysis of disease, tracking at the entry point. So, that's one impact.

Case WFB (PF). Personal Interview. 8 March 2010, p.26

Nonetheless, factors such as social and health problems attract the market to disequilibrate (Holcombe, 2003) and can push an economy away from equilibrium, producing entrepreneurial opportunities. The case of WaferGen presents the birth of gene technology expression, leading to the pursuit of a change in technology and the way that health checks screening for foreign workers is operated in Malaysia. Technology shapes how social issues are addressed by the legislators and thus entrepreneurs such as Mr. Nazri is alert at spotting the changes within the environments to create entrepreneurial opportunities. Consequently, technological change is a greater source of opportunity in some industries than in others, indicating that industries with closer ties to science (particularly biotechnology activities) have more entrepreneurial opportunities (Klevatorick et al., 1995).

¹⁹ Tuberculosis (TB), an infectious disease caused by a bacterium called *Mycobacterium tuberculosis*.

6.3 Case 3: Orchid Life

6.3.1 Individual Forces

6.3.1.1 Passion

Mr. Razak presents the strong personality of an entrepreneur with wide-ranging career experience working in several industries, including with the largest bank in Malaysia, Maybank²⁰. He was later with a multinational information technology (IT) giant, Hewlett Packard. It is known that entrepreneurs with varied work experience may have access to a broader and more useful store of information in their memory than ones with narrower experience (Romanelli & Schoonhoven, 2001). With his substantial and broader work experience, Mr. Razak responded critically to the question of his business philosophy and the motivation that persuaded him into a business venture. He clarifies, *"I motivate myself; I don't look to the outside to motivate myself."* From the interview observation, he presented the strong personality characteristic of an entrepreneur, including pride (Bierly et al., 2000), which occurs as part of the entrepreneurial process and provides an emotional resource for coping with entrepreneurial challenges (Cardon et al., 2009). While Mr. Razak's actions and words fit well with Schumpeter's (1946) argument that recognises that an entrepreneur needs an unusually strong will and personal strength during the process of creation which "is inherently emotional" (Goss, 2005: p.209). The interview recalls Mr. Razak's statement that opportunity existing in the environment, and the identification and creation of business opportunity, is an ongoing process. In sensemaking, this process never stops. He further claims, *"The opportunity comes along with it."* Hence, from the dialogues and stories of Mr. Razak, the interview captures his reaction and alertness to potential activities that may translate into business opportunities. Additionally, he was enacting and framing the problems of society to make sense of the activities and problems in the society that might shape future ideas/products or services. Entrepreneurial opportunities are situations in which it is possible to recombine various resources in a way that generates a profit and thus to be alert with important cues during interactions influenced how entrepreneurs recognize opportunities. Mr. Razak recalls;

We are turning problems into opportunity. That's how I see it. We observe, we communicate; we talk, discuss and gather information. From there, then we get the picture of the problem that affects our life, transforming it into a business opportunity.

Case OLF (PF). Personal Interview. 23 February 2010, p.8

²⁰ Maybank, a trade name for Malayan Banking Berhad, is the largest bank and financial group in Malaysia, with notable banking operations in Singapore, Indonesia, and the Philippines.

The history of Mr. Razak's family involvement in business nevertheless shapes his behaviour towards of business. His deep passion, alertness and ability to easily spot potential ideas, signs of opportunities and leading to the unflagging pursuit of challenging goals (Smilor, 1997) in a biotech business venture was amazing Mr. Nazri reiterates:

Financial rewards are the result of what you are doing but I see how far I can go because I've been doing this capital line. I've been watching myself as I've worked with local and multinational businesses so I've grown along the way. So, I think that is enough for me to see how far I can go, to do something from scratch.

Case OLF (PF). Personal Interview. 23 February 2010, p.5

To uncover the pursuit of the challenging goals, retrospectively, Mr. Nazri combined his tacit knowledge and experiences to shape the process of valuable business inputs into valuable output. The challenge is however, Orchid Life is a biotech business in which is different than banking. Thus framing both business issues in parallel might result in different outcomes. As biotech business demands long gestation period and strong institutional supports and funding, this serves as a challenge to Mr. Nazri when he said that "*I think that is enough for me to see how far I can go, to do something from scratch*".

6.3.1.2 Prior Knowledge/Experience

It has been argued that to better understand the locus and source of "opportunity discovery", one must attend to the possession of idiosyncratic information that leads to the existence and identification of entrepreneurial opportunities (Shane and Eckhardt, 2003). An implication of this is that prior knowledge plays an important role in the discovery perspective of opportunity (Sanz-Velasco, 2006). Several researchers point out that even if some of the information and knowledge can be learned through education, much of the necessary information about exploiting opportunities and coping with the liabilities of newness can only be learned by doing (Cope & Watts, 2000; Rae, 2000; Shane, 2003). For example, developing routines to form organisations may only be learned by creating organisations (Bruderl, et al., 1992; Shepherd et al., 2000), and gathering the right information and making effective decisions about opportunities may be something that can only be understood by undertaking those activities (Duchesneau & Gartner, 1990; Ronstadt, 1988). Thus, in many cases where family members were involved in business start-ups, they provided valuable access to immediate knowledge and experience. The learning processes of family members engaged in business apparently help the entrepreneur to gain useful access to existing personal and formal business networks in their family businesses, due to the family ties and their close relationships. This is evidenced in the case of Orchid Life:

It's planned, in a sense that my family is also into business. So, it's indeed planned. Personally, I want to go on my own and start my own business. We asked from the Universiti Putra Malaysia, to find out how we can commercialise the technology.

Case OLF (PF). Personal Interview. 23 February 2010, p.2

Prior knowledge might also explain why some individuals (in this case Mr. Razak), and not others, discover (or create and develop) opportunities. Different people discover various opportunities in a given technological development because their prior knowledge differs (Sanz-Velasco, 2006). Each person's individual prior knowledge enables this person, but not others, to recognise certain opportunities (Venkataraman, 1997). Fiet (1996) and von Hippel (1994) have pointed out that people notice information that is related to their existing knowledge; moreover, new information often needs to be complemented with prior knowledge to be useful (Shane and Venkataraman, 2000). Shane (2000) has shown that entrepreneurs discover opportunities that are related to their prior knowledge. Notwithstanding, entrepreneurs also recognize and discover opportunities that are related to their prior social learning process from family members experience in business. Family members through interactions transmit valuable information on key information on business ideas and social contacts that might not be available to non-family members. This explains Mr. Razak's intention to commercialise the technology as a pre-planned action in which he recognized during the interactions between and within his circle of family members and friends.

6.3.1.3 Business Networks

Scholars argue that personal networks are an important resource for the firm (Ostgaard & Birley 1994; Johansson 1995). Personal networks facilitate different kinds of business activities among entrepreneurs. The process of developing relationships and using personal contacts as a network appears to benefit from common goals between network members (Hakansson & Snehota, 1995; Nohria & Eccles, 1992). The purpose of networking within the communities was frequently referred to as an exchange of information (Silversides, 2000). Generally entrepreneurs participate themselves directly or indirectly with activities that allow relationship building that promotes exchange of information. These activities shape entrepreneur's ability to seek valuable key contacts within relevant business networks for effective decision-making. However, in the event of identifying and recognizing opportunities within uncertain business environment, different individual requires different approach in information exchange process. In Orchid Life case, Mr. Razak opts for the direct approach of a face-to-face meeting compared to other forms of strategies. Mr. Razak reiterates:

I don't play golf and I don't believe in playing golf to get business. My idea of doing business is to talk to them. I think that may be applied to other business. But our way of approach is more in explaining the technology we have through our meetings and studies. And we try to get involved in some of the events organised by some organisations and to look into the type of events that we attend. That's how we approach things. From your friendship, from your events you attend, you make contact and then you follow the leads, you know. You get more information.

Case OLF (PF). Personal Interview. 23 February 2010, p.9

Mr. Razak posits information as central to opportunity. He recognises that opportunity lies within the network of interactions among friends and through meetings, interactions, conversations, cues and valuable signs. To identify new opportunities, entrepreneurs must somehow perceive, gather, interpret and apply information about specific industries, technologies, markets, government policies, and other factors (Ozgen & Baron, 2007). However, the challenge is how do entrepreneurs decides and analyzes those information that are essential to opportunity creation and those who are not. Despite the role and importance of networks to Mr. Razak's business venture, he claims that some networks are a waste of time. He reiterates that entrepreneur should be selective in network building. While, different entrepreneurs demonstrates different selections of frame based on their past experiences, prior knowledge and socio-cultural influences. These factors complicate the process in which to locate information that can help advanced business opportunities. Similarly, Sarasvathy et al. (1998), Busenitz (1996), and many other researchers note that specific people discover opportunities because they gather and process information differently, perhaps more effectively than other people. Mr. Razak reflects his ideas.

That's why you have to keep on knocking on doors. You have to look for opportunities. When I knock on doors, we need to identify the type of doors that we knock on; I don't knock at any door.

Case OLF (PF). Personal Interview. 23 February 2010, p.11

In retrospective, this can only be known through prior experience that determines the effectiveness of such approach. As specific people discover opportunities because they gather and process information differently, Orchid Life demonstrates gathering and interpreting information to secure key valuable individuals through social media such as Facebook, Twitter and LinkedIn. The social media serves broader means of information sources ultimately supplying bigger network access to the company. Consequently, the larger the entrepreneurs' social networks, the more opportunities they recognise (Singh et al., 1999). Mr. Razak shares his business strategy:

We go and promote our company through Facebook; Facebook, through our own website and then through Twitter. It's about the social media and how you meet with them and how you meet with the client.

Case OLF (PF). Personal Interview. 23 February 2010, p.14

The critique is this approach might be perfect choice of Orchid Life but it might not be suitable and useful to other entrepreneurs. Hence, selection and recombination of resources in spotting business opportunities is useful yet influenced by several local and environmental forces. The decision on the right approach of networks should consider the interplay of all these forces and also the firm's resources (i.e. financial and human capital) in the opportunity discovery and creation process. With limited resources, entrepreneurs might seek other creative and innovative yet cost effective ways of enacting business opportunities. For an example, using information technology such as e-commerce through Business to Business (B2B) and Business to Consumer (B2C) to gain competitive advantage. Many small businesses and entrepreneurs, today utilises these technology resources to secure global market presence. E-Bay and Alibaba.com are both good example of technology platform used by entrepreneurs to address the issue of limited firm's resources.

6.3.2 Institutional and Sociocultural Support Forces

Governments of emerging economies in many Asian countries often extend loans to new ventures to encourage a pro-capitalist or business friendly initiative. Nevertheless, entrepreneurship liberalises the economy, promotes foreign investment, infuses new technology, and increases the standards of living (Zahra et al., 2000). This situation currently exists in the biotech industry in Malaysia. To stimulate biotech businesses, the government, through MBC, offers loans and grants to promising and qualified entrepreneurs. Institutional support also comes from banks and financial institutions, including the Small and Medium Enterprise (SME) Bank and the Malaysian Technology Development Corporation (MTDC), who provide financial assistance to biotech entrepreneurs. Mr. Razak recalls his company securing seed funding to help his business grow:

This company is a BioNexus company. They have the seed fund of RM2.5 million. The money we received was to spin-off our company.

Case OLF (PF). Personal Interview. 23 February 2010, p.2

Universities and research institutes (RI) are generally known as important sources of knowledge. However, RIs and universities are also well known as the biggest recipients of government funding and one of the generally accepted requirements stipulated by such grants/funds is to have a private/industry–government engagement. It is evidenced that the government looks at closer research/higher education institution–private/industry relationships. This approach creates the active participation of university–entrepreneur(s) and university–industry research involvement in collaborations, thus promoting action-based

research. The transformation in the process of managing research enhances the ability of entrepreneurs/private firms to learn and to gain access to valuable technology – technology that could be translated into profit opportunities. The phenomenon of business collaboration is eminent according to Mr. Razak, and he reiterates: *“The business collaboration was created with three Malaysian universities and an international partner from Holland. This relationship allows Orchid Life to share research facilities in the areas of agriculture and biotechnology.”* As for biotechnology, institutional support through policy and financial support helps to enable new business ventures to grow and cope with limited resources. Li, Wenli (2002) suggests that income subsidy programs and programs that specifically target the poor and capable entrepreneurs are effective in promoting entrepreneurial activity and improving total output. It contrasts with Dalley & Hamilton (2000); Zinger et al, (1996), they believe that the advice is not practical or tailored to their situation because the supporting agencies do not understand small business. Minniti (2008) argues this further in the statement below:

The government should endeavour to create enabling environments conducive to the division of labour, the commercialisation of invention, and exchange, as too much public involvement, without co-interest from the private sector, can hinder rather than help entrepreneurs by creating possible market distortions. (Minniti, 2008, p.787)

Hence, to stimulate conducive business environments, governments should reduce constraints on entrepreneurship (Acs et al., 2004) and policy makers should reallocate resources to programmes that support high growth companies (Shane, 2009). Petty (2006) highlights the need to examine entrepreneurship policies from a more strategic perspective that considers the fit (Venkatraman and Camillus, 1984) of these policies with the needs of the firms operating in entrepreneurial environments and examines how government policies may serve as linking mechanisms between the network of actors throughout the various stages of an entrepreneurial venture’s lifecycle. Petty and Shane’s suggestions are appropriate considering Malaysia biotechnology as the industry of high growth industry and still at the infancy stage.

6.4 Conclusion

This chapter concludes by summarising the contributions of three different cases of personally funded entrepreneurs. To summarise the analysis, a table is created (Table 6.2) to demonstrate different patterns of outcomes. This is presented below;

Table 6.2: Summary of Contributions of Personally Funded Cases

	Brass Bakti	WaferGen Biosystems	Orchid Life
Individual Forces	<p>Passion shape the respondent's strength and courage and mobilizing energy and technical expertise of his partner, Haji Rahman to form business partnership facing the challenging goals.</p> <p>Passion fuels the respondent's drive to take the risk of venturing into something new despite having a stable career.</p> <p>From the cues, the respondent took action, to translate his ideas, and convert his vast resources of business networks into potential business opportunities.</p>	<p>With different sets of prior knowledge and experience, the respondent presents a disparate pattern of behaviour affecting his identity, supporting Shane's (2000) results confirming theoretical speculation (Ardichvili et al., 2003; Hayek, 1945; Venkataraman, 1997) that different types of prior knowledge will affect the manner in which one identifies opportunities.</p> <p>The finding suggests that prior management experience increases an individual's intention to start a new venture, thereby facilitating the opportunity discovery process. The respondent searches for meaning, presenting coherent, reasonable and emotionally appealing good stories about their business ideas.</p>	<p>Here, alertness to potential activities may translate into business opportunities. The respondent enacts and frames the problems of society to make sense of the activities and problems in the society that might shape future ideas/products or services.</p> <p>With limited resources, entrepreneurs might seek other creative and innovative yet cost effective ways of enacting business opportunities.</p>
Institutional Forces	<p>Opportunity creation is driven by institutional supports from the government. This helps facilitates businesses in bridging the limitation faced by entrepreneurs.</p>	<p>Trust is one form of resources to address Wafergen's limitation of securing financial supports. Wafergen's survival is influenced by the strong business identity, in this case, the trust.</p>	<p>The findings support the notion that income subsidy programs and programs that specifically target the poor and capable entrepreneurs are effective in promoting entrepreneurial activity and improving total output (Li, Wenli, 2002).</p>
Sociocultural Forces	<p>The respondent demonstrates what he says was shaped by social factors, connecting him with the societies.</p>	<p>Factors such as social and health problems attract the market to produce entrepreneurial opportunities. The respondent was alert in recognizing the changes</p>	<p>The finding suggests the role of Malaysian regulators to enable the society and reduce constraints on entrepreneurship by effective</p>

		in the environments to create entrepreneurial opportunities.	entrepreneurship acculturation efforts.
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This chapter posits that to be able to recognise and create opportunity, entrepreneurs must be alert to cues in the business environment. From the dialogues and market cues he realised there was a high demand for smart chip technology in Malaysia. The evidence that prior knowledge and experience have a positive influence supports other studies that suggest prior management experience facilitates the opportunity recognition process and makes these individuals more likely to start a new venture (Delmar & Davidsson, 2000; Honig & Davidsson, 2000). This is consistent with the notion of Johansson (2000) that the broader the entrepreneurs' informal networks are, the more likely they are to gather relevant information. Identity often plays an important role in decisions, especially important life decisions (Read et al., 2011), such as those made by the personally funded entrepreneurs thus utilising their business networks to increase their competitive advantage and to secure bigger market shares locally and abroad.

The analysis findings suggested that the identification and creation of business opportunities is an ongoing process (in sensemaking, this process never stops). Having family members who are engaged in business apparently enables the entrepreneur to access their personal and formal business networks as well. Through meetings, interactions, market analysis and industrial reports, ideas are enacted. Information is crucial in enabling entrepreneurs to recognise opportunity. In order to identify opportunities for viable new ventures, entrepreneurs must somehow perceive, gather, interpret and apply information about specific industries, technologies, markets, government policies and other factors (Ozgen & Baron, 2007). In the biotechnology industry, institutional support through policy and financial measures helps new business ventures to grow and cope with the liabilities of newness, such as lack of funding and access to human capital. Such institutional deficiencies were relatively more detrimental to the process of opportunity creation in all cases and were highly contingent on effective regulatory and policy enforcement.

Chapter Seven

Malaysian Biotechnology Case Study: Government Funded Entrepreneurs

7.0 Introduction

Similar to Chapters Five and Six, this chapter examines the issues of entrepreneur's opportunity discovery and creation in the influenced of individual forces, institutional support forces and sociocultural forces. This involves investigating and interpreting how government funded biotech entrepreneurs in Malaysia to the phenomena. This chapter concludes by providing a summary of the patterns and key themes of the findings. The cases are analysed individually, engaging sensemaking theory, as a theoretical vehicle of the research framework. The analysis of the three cases are first analysed in this chapter and the background is presented in Table 7.1: Background of Government Funded Cases.

Table 7.1: Background of Government Funded Cases

Cases	Background	Respondents
Innobiologics	Innobiologics is a company that is involved in the advanced production of GMP ²¹ biopharmaceuticals, with a specialization in mammalian cell culture technology. Aimed at providing a better quality of life through development and biopharmaceuticals, this company provides comprehensive services using fully integrated technology for humanisation of non-human antibodies that can be safely administered to patients. Innobiologics is a biotechnology company focusing on areas of cell line development, antibody services, process science development, bio manufacturing and contract research and training. This government initiated venture was first headed by Dato' Dr. Nazrul.	Dato' Dr. Nazrul
Farmina Bio Plus Industries & Consultants	Once a mere clinic, Farmina Bio Plus Industries & Consultants is yet another biotechnology related company founded by Dr. Farminah Hasan in 2004 that began its operation in 2005. This company specializes in biotechnology, biochemical and homeopathy-based activities involving herbs. Among the products developed by Farmina Bio Plus Industries are, Biochemic Plus, Bio-Haz, Bio Lingua, the Bio-Qi, Bio Sasmah and Kacip Fatimah. Apart from manufacturing these products, Farmina also offers training and workshops for potential job candidates to help them survive in the business.	Dr. Farminah
Invitro Tech	Collaborating with Melaka Biotechnology Corporation, Invitro Tech Sdn Bhd was established in 2005. With complete facilities and an advanced R&D laboratory,	Mr. Shukri

²¹ A production and testing practice that facilitates ensuring a quality a product.

	<p>this company specializes in the research and development of plant and tissue culture technology. This company works on the refinement of tissue culture protocols, DNA profiling and phytochemical studies of selected medicinal plants that yield superior planting material. The two main plants produced by Invitro Tech are bananas and herbal plants; however, since 2011 Invitro Tech has started to commercially produce three more plants, namely ginger, cur cumin and stevia. Clients of Invitro Tech include the State Agricultural Department, GLCs (government-linked companies), private plantation companies, and smallholder farmers.</p>	
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7.1 Case 1: Innobiologics

7.1.1 Individual Forces

7.1.1.1 Prior Knowledge/Experience and Passion

In the process of maturing during his career, Dr. Nazrul has developed his identity, and now he often faces conflict when defining his passion and ambitions compared to the institution's expectations. The feeling of unhappiness while serving as an academic in one public university in Malaysia later led him to a career change. He says, *"It was a disappointment at the university; I was telling myself, 'Look, I am not feeling good about staying in the university,' because of some issues about the appointment of a professorship; I was not happy with the way it was handled."* After years of teaching, he left, frustrated by the lack of clear systems in the education industry. This move meant a challenge for him as he needed to reposition and redefine his role and identity from teacher (academic) to sales manager of a multinational pharmaceutical corporation, and this demanded strong discipline to learn something new from the fast moving and challenging pharmaceutical industry despite having a PhD in biotechnology. This stage might have led to an unbearable feeling of discontent and job dissatisfaction. Much of the job satisfaction literature posits that organisational climate determines job satisfaction (Agho et al., 1993; Welsch & LaVan, 1981). Job dissatisfaction evolves from the lack of a supportive organisational climate in the form of a lack of incentives and career progression. A supportive organisational climate is often represented by a management commitment, strong supervisory and peer support, and opportunities for innovation (Niehoff et al., 1990; Yuki, 1989). Dr. Nazrul recalls:

In 1986 I was recruited as Assistant Lecturer at one of public university in Malaysia. I was interested in biotech. I progressed with a Master's at the University of New South Wales and then, with good results, I got a scholarship to continue with a PhD in the University of Queensland. Then after graduating I got my PhD, unfortunately I didn't see my career

movement in academia. So I decided to resign and join the private sector. I joined B. Braun Medical (an international company dealing with pharmaceutical and biotech products) as a sales manager doing technical sales for Biotech Division and B. Braun Medical. It was a disappointment at university, I was telling myself, "Look, I am not feeling good about staying in the university," because of some issues on appointment of professorship; I was not happy with the way it was handled. To me it didn't look clear enough; my argument was especially that they kept changing the goalposts so, not something that I was happy with. I decided to probably think about myself.

Case INB (GF). Personal Interview. 11 February 2010, p.2

Hence, the conflict Dr. Nazrul experiences increases the feeling of perceived self-efficacy²², which Lee et al. (2011) argue could strengthen the relationship between low job satisfaction and entrepreneurial intentions. The personality and identity of Dr. Nazrul conform to the notion of Lee et al. (2011), which proposes that employees who are confident of their job skills may be more motivated to leave their companies to start businesses, if they experience low job satisfaction. Nevertheless, the learning process for Dr. Nazrul was when he gained valuable knowledge and experience of operating and managing the sales department, which he says, "*was like running my own business, demanding, strict profit and loss disciplines*". While at the peak of his career in the multinational corporation (MNC), he was hand-picked by the former science advisor to the former Malaysian Prime Minister, Tun Dr. Mahathir Mohamad, to head a very challenging task of founding and running a government funded firm engaged in the advanced production of biopharmaceuticals, and specializing in mammalian cell culture technology. Dr. Nazrul was appointed as the first CEO of the company that aimed to provide a better quality of life through development and biopharmaceuticals, and comprehensive services that are reliable, fast and cost effective, using fully integrated technology for the humanisation of non-human antibodies that can be safely administered to patients. He utilises his background of vast interactions and social networks to help spearhead this daunting task.

7.1.1.2 Business Networks

Professional networks are certainly especially relevant for high-tech venturing processes and the founders often keep in touch with their educational origin, a key determinant of professionalism (Johannisson, 1998). Personal networks are relationships of individuals with other individuals (Lechner & Dowling, 2003) and trust represents one belief in the reliability and truth of relationships developed in personal networks. Trust is indicated within business relationships (Borch & Arthur, 1995; Hakansson & Snehota, 1995; Perrow, 1992). The

²² Bandura (1994) defines people's beliefs in terms of their capabilities to produce designated levels of performance that exercise influence over events that affect their lives.

conditions in which trust can be generated require participants to acknowledge and accept theoretical vulnerability to the other party (ies) within a relationship, yet continue to invest time and resources into the relationship(s), as the benefits outweigh the risks (Blois, 1998). The notion of trust should not be seen as something which is optional, as mutual interdependence is at the heart of business, and businesses are built upon 'a myriad of often subtle agreements and obligations that transcend any legal stipulations' (Shaw, 1997). Relying on strong business values and trust²³, Dr. Nazrul managed to secure an expert referee from a reputable business organisation who later became his company's business partner. He asserts:

"Trust is very important. If the person trusts you, you'd be in the job. For example, people like Dr. Joachim. He used to work for Boehringer Ingelheim²⁴ [an international company dealing with pharmaceutical and biotech products] and in fact, he helped us. He's speaking well about us. So his ex-boss decided to come over and have a look at our facility and we hope to build relationship and get business from Biogen Idec.

Case INB (GF). Personal Interview. 11 February 2010, p.9

Without prior established relationship with Dr. Joachim, it might be difficult for Dr. Nazrul to deliver convincing ideas about any particular business proposal. The relationship process between Dr. Nazrul and Dr. Joachim identifies that trust is a product of social networks or personal relationships, which serve as preconditions for business exchanges (Granovetter, 1985; Larson, 1992; Redding, 1990). Relationships evolve slowly, starting with the exchange of relatively low-value benefits and escalating to higher-value benefits as the parties demonstrate trustworthy behaviour (Blau, 1964) and gain potential benefits from the network of relationships. Many studies claim networking contributes to the entrepreneur's ability to discover opportunities to find resources and gain legitimacy (Elfring & Hulsink, 2001; Johannisson, 1998; Aldrich, 1989). Networks, personal or formal, expedite the supply of information to entrepreneur. Dr. Nazrul secures the possession of networks through trust and attracting valuable information and key individuals to facilitate his business active participation in professional forums and one was mentioned, the IEEE (Association for Technical Engineers). He further suggests, "*Networking is very important. People don't give you business because you have a facility. People give you business because they know you. The network is definitely a very important tool for us.*"

Entrepreneurs may gain access to important forms of information by virtue of their current jobs – especially jobs in research and development or marketing or social activities – which

²³ Trust is defined as the willingness of a party (the truster) to be vulnerable to the actions of another party (the trustee), based on the expectation that the trustee will perform a particular action important to the truster, irrespective of the ability to monitor and control the other party (Mayer et al., 1995).

²⁴ An international company dealing with pharmaceutical and biotech products.

keep them abreast of changing technological and market conditions (Aldrich, 1999; Klepper & Sleeper, 2001). Having worked for several MNCs, Dr. Nazrul has accumulated a valuable amount of varied work experience, hence having access to a broader and more useful store of information in his memory than those with narrower experience. In communicating and translating his business ideas to create business networks, Dr. Nazrul stresses the importance of social media in the biotech business. He explains his strategy of engaging with social media such as LinkedIn²⁵ to communicate his ideas and business, and to gain access to more key individuals and institutions that allow greater access to new trends and patterns in the area of biotechnology. These provide him with critical information on issues such as new product offerings and potential market collaborations. This works on the principle of personal relationships and Dr. Nazrul recalls his story on how LinkedIn facilitates such active personal relationships connecting to new business opportunities:

And then in fact, I am in LinkedIn [the world's largest online professional network with over 120 million members]. So LinkedIn will connect you with so many people professionally. LinkedIn is a professional network developed on the internet to link you. So I connected with my ex-colleague who is in Sartorius. I connected to several people from Pfizer Incorporated [a pharmaceutical company, ranking number one in sales in the world, based in New York City, US]. From that connection, we were also connected to a Malaysian now in Genentech [Genentech Inc is a biotechnology corporation, which was founded in 1976].

Case INB (GF). Personal Interview. 11 February 2010, p.10

Dr. Nazrul realised that he needed to keep pace with the latest media technology to ensure visibility of his identity and his business venture's identity. These efforts of Dr. Nazrul suggest that trust; business networks (be they formal or personal) and social media are acts of enacting sensible environments²⁶ to attract business opportunities. However, being a wholly funded company, with direct support and facilities from the government, it is reasonable to accept the positive view that he presents, such as on the government's policy and funding. He says,

I think the Malaysian government is a very proactive government. I think from what we have done so far in terms of biotechnology and the commission of Biotech Corporation, and the incentive programme, we are one of the best in Asia. With the BioNexus²⁷ status and all the necessary help from the government to hire foreigners on board, we have a very good programme. I believe Malaysia would definitely be a country that can spearhead this effort because I think our educational programme is one of the excellent educational programmes in Asia. We have got basically one of the best infrastructures in Asia and I think with the capability of our educational programme infrastructure, the recipe or the ingredient to be

²⁵ An online business social network.

²⁶ Entrepreneurs discover and create the environments they face in dialogues and narratives.

²⁷ A designation awarded to qualifying biotechnology companies, making them eligible for privileges contained within the BioNexus Bill of Guarantees.

successful in the area of biologics manufacturing is there, except that we do not have experience.

Case INB (GF). Personal Interview. 11 February 2010, p.1 & 9

Interpreting Dr. Nazrul's statement, he was careful in providing any views on the government's policies. This includes on the policy matters of biotech. Instead of demonstrating a balanced view of government's effort on biotech initiatives, he was merely promoting the ideas and less analytical.

7.1.2 Institutional Support Forces

The positive views given during the recorded interview session were interpreted and regarded as *playing safe* as he was a CEO personally chosen and hand-picked by the science advisor to the Prime Minister of Malaysia. Perhaps his views and ideas were representing his *master's* view. The privilege he has as one who has direct access to the top government officials nevertheless helps his business in the complicated government–private relationship. Dr. Nazrul pioneered a formal government–private partnership in return for government funding/grants. This collaboration includes an active partnership with the National University Hospital to build and manage the company's stem cell lab in the hospital. The partnership allows the hospital staff to engage in stem cell action research as this can be practically tested and used in the hospital. As an actor and facilitator between his company and the funder (Malaysian government), Dr. Nazrul's role was merely an opportunity broker. His task was to ensure that the government's mission is achieved. Hence, his challenge is to create and secure as much resources and supports from the government to help enact more business opportunities for the company. In the interview, Dr. Nazrul explains the challenges to his company. Despite being a government-owned company, Innobiologics was never given the privilege to secure additional funds (except a basic research grant) from MOSTI (the Ministry of Science, Technology and Innovation)²⁸. He recalls, "*Because we are government companies we don't get them.*" Innobiologics was asked to source help from other institutions to be sustainable and thus borrowing was required from these institutions to stay competitive. Dr. Nazrul recalls his story:

We borrow money from the Development Bank (Bank Pembangunan). It does help the company to drive forward. [The process of getting financial assistance] Very challenging, very challenging. Always a tedious process. We just have the discussion. Yeah, they slap us. Of course the interest rate is still high. So, we negotiated of course. We wanted to get a

²⁸ The Malaysian ministry in charge of science, technology and innovation in Malaysia.

lower interest rate because of the financial crisis; customers are not very happy. So there are challenges on the financial side. Everybody's feeling the pinch. OK, so we say to the Development Bank (Bank Pembangunan), "We feel the pinch; we need your help, so hopefully we can negotiate down the interest rate."

Case INB (GF). Personal Interview. 11 February 2010, pp. 21–22 & 24

Malaysian government resource related policies stimulate small firm access to human, financial capital and information/knowledge. Policies have the distinction of either improving the financial conditions of the firm or improving the operating efficiency of the firm (Storey, 1994). Financial oriented policies focus on reducing market imperfections and take the form of alternative capital markets (Fuduric, 2008). In biotech case in Malaysia often this is seen as direct payments of soft loans or grants to the firm or even as a form of venture formation of government's linked corporation such as Innobiologics. One problem with stimulating entrepreneurship in this way is that the wrong type of person may be attracted to such an offer hence a person may become an entrepreneur because the funding is available not because their idea is marketable (Fuduric, 2008). Instead of general policies that focus on the small business sector as a whole, policies can also target specific sectors, regions or groups. Some of these policies include different groups of people (youth, women, and unemployed graduates), different sectors of industry (IT, biotechnology, manufacturing). There are mixed results with sectoral policies (Storey, 1994). It seems that execution and efficiency are integral to carrying out these policies successfully (Fuduric, 2008). Consequently, efficient policies help generate and stimulate activities that shape entrepreneurial opportunities.

7.1.3 Sociocultural Forces

In the interview, Dr. Nazrul refers to a widely discussed social and health issue in Malaysia, cancer. He claims that cancer is the number one killer in Malaysia. Dr. Nazrul posits that many cancer patients face difficult times managing the treatments due to the high cost of treatment and drugs for the cancer. Dr. Nazrul felt that the role of government is eminent in helping to lessen the burden of cancer patients in Malaysia. With the passion for and prior knowledge of biotechnology, his business focuses on biologic²⁹. He sensed that biotechnology products and the solution of generic drugs could help reduce Malaysia's high dependency on drugs or vaccines and this would be translated into national savings and help for the poor societies who cannot afford expensive drugs. Dr. Nazrul says, "*We are focusing our attention on how to produce drugs that will be able to basically improve the*

²⁹ A medicinal preparation developed by a biological process.

livelihood of the patient or cure cancer. So, that is the focus. Looking at that, we know that cancer is the number one killer, not only in Malaysia but throughout the world.”

Dr. Nazrul extracted cues through social learning experiences he gained in the multinational pharmaceutical company. He posits that the MNC's CEO guided him to recognise the importance of time and business, while building a unique identity in him that values a culture of the *“thinking organisation”* rather than a *“yes man”* organisation. Dr. Nazrul argues that Malaysian culture never promotes questioning too much; the reluctance of people to express themselves in front of others hinders his efforts to create the thinking organisation. He shares with me his views on the issue of transforming and changing the current values in his organisation:

The challenge is I need to strengthen the group, and to communicate well with the staff, understanding the issues and problems. We need to know all the issues at the heart of the organisation. So knowing and steering the whole organisation is very important. So obviously there's the challenge of getting everybody to have the same vision – it's the greatest challenge. I mean, people look at you from different perspectives.

Case INB (GF). Personal Interview. 11 February 2010, p.7

Dr. Nazrul's management style in Innobiologics was based on cues³⁰ extracted from practical experience he accumulated over years when serving as a sales manager, an ongoing process which simultaneously shaped his identity and his business venture's identity. This is the identity that he presents in his current company, recognising the value of inculcating analytical thinking among his employees, an important entrepreneurship characteristic. He recalls:

I learned a lot from my CEO at that time, Mr. John Lee. He really got me up to speed and understanding how to really run a business (B. Braun). I was really being helped. We need to have a thinking organisation. We cannot be a 'yes man' organisation. A thinking organisation – people need to think and contribute to the thinking process and also to change the mind-set and culture because our culture never promotes questioning too much; teaching them to express in front of the person. We must practise a democracy where you can express your opinion. You must express your opinion and then as long as you have expressed it, you have done your part.

Case INB (GF). Personal Interview. 11 February 2010, pp.6 & 8

Social values and beliefs may influence organisational culture and entrepreneurs in one way, or in another way influence the direction of the organisations that they lead. The entrepreneur's perceptions of values and beliefs are also affected by their career experiences and, as stated by Carroll and Mosakowski (1987), prior start-up experience

³⁰ Evidenced by the fact that he reacted and took action based on precedence over accuracy.

increases the probability of exploitation of entrepreneurial opportunities since learning reduces the costs related to this endeavour. Understanding the theoretical framework of the thesis, the lessons learned from prior experience/knowledge might consequently enhance the ability of entrepreneurs to effectively recognise and create entrepreneurial opportunities thus complementing on the earlier studies of Ronstadt (1988) and Ucbasaran et al., (2003).

7.2 Case 2: Farmina Bio Plus Industries

7.2.1 Individual Forces

7.2.1.1 Passion

Dr. Farminah says, *“I didn’t plan to become an entrepreneur. I was only interested in doing research.”* The interest in doing research in homeopathy and biotechnology led her on a journey resulting in a diverse range of the positive effects including pride, enthusiasm and joy (Smilor, 1997) that occur as part of the entrepreneurial process and that have provided her with powerful emotional resources for coping with entrepreneurial challenges. The journey of Dr. Farminah was a natural process of any individual engaging in activities that later became their income generating businesses. Nevertheless, her passion, enthusiasm and joy in research lead her to documentation of valuable formulae’s and tips passed and learned through his family members and learning at the university. Dr. Farminah explains;

The outcome of my research, what I’ve written down with so much interest – documentation. Documentation makes me successful. When you document what you see, you can only reach one conclusion. Not only that, it can be one very big business opportunity. Even though I am already old, my mental activity is still active. Activities [such as] I read, do research, so, [I] log on the internet looking for materials. The strong point – perhaps the strong point that I have is that I love to learn. Passion for learning means my curiosity towards something, “Why is this like this, yeah? It is like that. So, when I fulfilled this curiosity, it turned out to be the foundation of entrepreneurship.

Case FBP (GF). Personal Interview. 3 February 2010, pp.11 & 14

Dr. Farminah’s passion in reading and research activities reflects her interest in increasing her knowledge; hence love and passion can fuel motivation, enhance mental activity, and give meaning to the everyday work (Brannback et al. 2006) of entrepreneurial activities. Dr. Farminah demonstrates the strong will to learn and to research during the process of opportunity creation. Schumpeter (1946) long ago recognised that an entrepreneur needs unusually strong will and personal strength during the process of creation, which “is inherently emotional” (Goss, 2005: 209). While, passion drives the emotional feeling of Dr. Farminah to explore and connect further to other challenging activities that helps her

business to venture into valuable business opportunities. However, the limitation of Dr. Farminah is to ensure that the tacit knowledge gained to be systematically transferred and translated into similar quality product / services to continue his business's venture.

7.2.1.2 Prior Knowledge/Experience

Dr. Farminah was a professionally trained counsellor with a Master's degree in Counselling Psychology. She later served as a counsellor at the Welfare Centre in Johor³¹. During this period, she learned the arts and skills of managing stress, emotions and mental problems. She gained valuable experience through charity work with the Tampoi Hospital³². Her prior knowledge and skills in treating people with mental or social problems and issues have stimulated her interest in becoming a homeopathy practitioner-cum-entrepreneur. Dr. Farminah produces biochemical and homeopathy-based products involving herbs to address the societal problems of slow learners and of mental and aggressive behaviours. Her specific knowledge and experience in counselling have had a strong influence on her development and interest in entrepreneurship activities. This implies that individuals with prior experience as a customer or supplier in an industry often have a better understanding of how to meet the demand conditions in that marketplace, as industry experience provides information that outsiders cannot gather (Johnson, 1986). Founders tend to start businesses in industries in which they were previously employed, because their employment experience allows them to take advantage of information and opportunities gathered from their previous employment (Aldrich, 1999). The entrepreneurial involvement of Dr. Farminah was closely connected to the role and influence of the identity of her family members. Her grandfather was of Chinese origin and a businessman, her father was the owner of a retail shop and her mother a village traditional healer. This supports Vesper's (1983) notion that societies that value entrepreneurship and innovation instil effective societal systems promoting opportunity driven entrepreneurship. Dr. Farminah shares her story:

On my grandfather's side, he is indeed Chinese. So, perhaps having a bit of Chinese blood, I like doing business. My family – ever since I was small, my father was a businessman. The environment itself or the family or the friends – it has already been ingrained in me. Ever since I was small, the age of five or six, my father involved me in his business. So my father opened a shop, a retail shop. Then he'd do business as well. Then my mother was the village traditional healer. Ever since I was small, I was already preparing the herbal concoctions for the patients. So, I was like the pharmacist [for my mother]. When I grew up, studying in the university, I became interested in that particular field [medicinal herbs/homeopathy].

Case FBP (GF). Personal Interview. 3 February 2010, p.12

³¹ Johor is one of the states in Malaysia.

³² A hospital that specialises in and treats patients with mental illness.

Dr. Farminah's story demonstrates the powerful family as the role model in business, thus shaping her identities and actions in business, as supported and explained by Rae (2007):

Families are often significant in shaping people's identities and actions. Families in which parents have started or run businesses often encourage their children's entrepreneurial behaviour as role models. (p.46)

Looking back at the theoretical framework of the thesis, the case of Dr. Farminah helps explain further how and why certain entrepreneurs perceive and behave in certain ways. The role of entrepreneur's identity evolves within the closely knitted family and social-cultural relationships thus influencing their thinking in spotting and creating business opportunities. Another interesting individual force that provides meaning to the process of opportunity creation is the notion of curiosity. To analyse and make sense of Dr. Farminah's case, the thesis reflects on the case of Jack Dorsey. The story of Jack Dorsey, the co-founder of Square and Twitter, relates closely to the idea of curiosity. Jack was obsessed with maps. His curiosity drove him to learn more about the immense databases of New York City, presenting pictures of real live data, a real live city operating in front of him. He then went to college to study computer science and worked for a number of companies. Later, he decided to bring all his love and obsession of maps into the workable ideas of Square and Twitter. The stories of Jack and Dr. Farminah are both connected to the entrepreneur's curiosity. They embarked on mental and research activities, also known as the process of learning – learning by asking about and questioning the environment, its needs and issues. Curiosity may also lead to innovation and so, in some ways, can open up potential business opportunities. Dr. Farminah recalls her views on curiosity:

I was really curious to know what is happening and how the process occurs, how does biotech help people – that was what I really wanted to know. So, even though I majored in Psychology and Counselling, I learned all those technical [parts of biotech] through courses that I had taken separately.

Case FBP (GF). Personal Interview. 3 February 2010, p.12

7.2.1.3 Business Networks

Word-of-mouth (WOM) communications amongst entrepreneurs and small business owners are a common source of innovative ideas (Stokes, 2000). Indeed word-of-mouth marketing (WOMM) is important throughout the innovation process as it plays a key role in consumer adoption of new products and services (East, 1998). As in the two earlier cases of Brass Bakti and Powerbiotechnologies, WOMM generated a considerable impact on Dr. Farminah. From her visit to China she was able to secure crucial and valuable access to funders. She narrated an interesting story that led to her company getting a RM400000 loan on attending

a business trip to China. She passionately shares her experience of promoting her business through a media documentary advertising strategy to gain wider public acceptance of her products:

There is this one company [owner] whose child took my product. After four days, that child was becoming keen on reading, keen on doing calculations [and] keen on drawing. The father was dead shocked, in a harsh way that is. Immediately he chased after me. Right away he went to the exhibition, the hotel that I was staying in, because he wanted to know, "What is the secret of your products, that my child is suddenly so keen on his learning?" So, since the one feeling the amazement was Chinese, he ran after me too, so the VIPs (Very Important People) who went to that international trade exhibition said, "Oh, this Dr. Farminah is a competitive person. Look at how those people chase her, look at how those people negotiate with her, look at how those people assemble around her, look at those reporters, how they are all interviewing her. They were interviewing me when I was in China. From 12 days of being in China, I got the title of "The Lady of Kunming" (the capital and largest city of Yunnan in China). For that, when I came back, MARA gave me RM400,000. From 3 machines, I now have 16 machines. Through Federation of Malaysian Manufacturer (FMM)-from this formal [network], there are the TV people who came to interview me about how I do my work, and to interview my customers. That is the one that made me known, through the network of being a member of FMM. When it's on TV, we get to do promotions.

Case FBP (GF). Personal Interview. 3 February 2010, p.14–15

The story of Dr. Farminah's business trip to China was again the act of demonstrating workable products, hence creating cohesive and convincing stories for the people. Ozgen and Baron (2007) claim that participation in professional forums such as conventions; conferences, seminars and workshops are social sources of information exerting direct, positive effects on opportunity discovery. They argue that the greater the extent to which entrepreneurs have mentors and informal industry networks, and participate in professional forums, the greater their alertness to new business opportunities. However, in the case of her company, Dr. Farminah's participation was mediated by the effect of the WOMM strategy, and though unplanned it had a considerable effect on her ability to secure substantial funding. Therefore, activities (interactions and communications in trade exhibitions such as the one in China) provide Dr. Farminah with useful information that enable her to build wider and more effective business networks. This supports the notion of Venkataraman and Van de Ven (1998) that the survival and growth of an entrepreneurial firm depends on its ability to maintain and extend its network of inter-firm relationships. Despite the positive influence of WOMM, FBP's business was affected by the counterfeit products sold at cheaper price in the local market. Invariably, the availability of such products in the markets might be harmful to the public and the company's positive image. Negative word of mouth is more influential than positive word of mouth (though this claim may conflate relative incidence and relative impact) (Assael, 2004). According to the Krolloff (1988) principle, negative copy is four times as persuasive as positive copy. This forms a

challenging journey ahead for Famina Bio Plus as the negative images impacted from the opportunists might shape the future business of the company.

7.2.2 Institutional Support Forces

As Mises (1949) puts it, entrepreneurship is a characteristic of human action and can be found anywhere at any point in time. Consequently, Baumol's basic assumption is that, while the total supply of entrepreneurs is relatively constant across societies, the productive contribution of entrepreneurial activity varies because of its allocation between desirable activities, such as innovation, and unproductive activities, such as rent seeking or organised crime. Nevertheless, government policy can influence the allocation of entrepreneurship more effectively than it can influence its supply (Baumol, 1990; Bowen & De Clercq, 2008) by having appropriate entrepreneurial institutions (e.g. MBC) to manage biotechnology policies effectively. In creating appropriate entrepreneurial institutions, the government has to consider the underlying social issues embedded in Malaysia's socio-economic history. Any policy intervention by the Malaysian government should seriously include the complex relationships of whom and what control the business in the country. In other words, the policy intervention on entrepreneurship should consider the interests of the Malay majority populations. Engaging communities and races in policy development perhaps supports the country's political stability, the recipe behind Malaysia's economic success. The formula for stability was regarded as the ability to power share by the three major races³³ in Malaysia, that that led to the introduction of the new affirmative action programme, DEB (*Dasar Ekonomi Baru* or New Economic Policy), for the Malays. The introduction of DEB was intended to allocate productive activities and policy strategies to enable the majority Malay population to move out of poverty. This has led to the birth of Farmina³⁴, aimed at engaging the Malay majority to start a business for a living for the purpose of maintaining peace in the society. Dr. Farminah relates her involvement in this government's effort as follows:

I was hired in the Malay–Chinese Entrepreneurial Gap Reduction Programme to maintain peace in the Malaysian society. That programme contained 5 series. Out of 55 chosen candidates only 10 candidates are still in business, including me.

Case FBP (GF). Personal Interview. 3 February 2010, p.5

As Wagner and Sternberg (2004) posit, entrepreneurial efforts are to be allocated to productive activities, and policy strategies, with respect to entrepreneurship, need to be tailored to the specific institutional context of each economic region. Hence, policy strategies

³³ Malay, Chinese and Indians.

³⁴ Formed through the Malay–Chinese Entrepreneurial Gap Reduction Program.

in the Malaysian context demand institutional support to effectively stimulate business activities. One positive impact of the implementation of the National Biotechnology Policy (NBP) was the involvement of both government and private institutions in providing financial assistance to new and existing entrepreneurs in the form of grants, matching grants, normal loans, soft loans, etc. Dr. Farminah was an example of an entrepreneur securing multiple grants from various institutional funding sources, including a loan a RM400000 for the purpose of purchasing machines and a grant for the purpose of attending a business trip to promote products and services abroad.

I received a grant in the form of going and doing exhibitions overseas. Under MARA³⁵ I got to go to China twice. Under FAMA (the Federal Agriculture Marketing Authority, a marketing agency established by the government under the Ministry of Agriculture, Malaysia), I went to Singapore twice. Under MATRADE (the Malaysia national trade promotion agency) I went overseas twice. Government policy is giving opportunities to me.

Case FBP (GF). Personal Interview. 3 February 2010, pp.13–14

Consequently, institutional supports such as fundings and grants, drives entrepreneurial activities to the next level in which affects other actors outside of the business context such as technology suppliers, contractors, users etc. Connecting to the thesis's framework, the relationship signifies and iterative and on going process while expanding the opportunities to a larger audience. However, Shane (2009) argues that this is bad public policy. Encouraging more and more people to start businesses will not enhance economic growth or create a lot of jobs because start-ups, in general, are not the source of our economic vitality or job creation (p.142). Shane (2009) explains:

Instead of just believing naively that all entrepreneurship is good and developing policies to increase the number of average or typical entrepreneurs, policy makers need to recognise that only a select few entrepreneurs will create the businesses that will take people out of poverty, encourage innovation, create jobs, reduce unemployment, make markets more competitive and enhance economic growth. The way to enhance economic growth and create jobs is pretty straightforward. Stop subsidising the formation of the typical start-up and focus on the subset of businesses with growth potential. Getting economic growth and jobs creation from entrepreneurs is not a numbers game. It is about encouraging high quality, high growth companies to be founded. The evidence on high growth start-ups is consistent. A tiny sliver of companies accounts for the vast majority of the contribution to job creation and economic growth that comes from entrepreneurial activity. (pp. 145–146)

The efforts of the Malaysian government to focus on encouraging high quality, high growth companies in the biotech industry through effective allocation of resources is justified and

³⁵ The People's Trust Council (MARA), an agency of the Ministry of Rural and Regional Development, Malaysia, was established on 1 March 1966 under an Act of Parliament as a statutory body as a result of the first *Bumiputera* (native) Economic Congress resolution.

supported. However, the focus should be channelled towards enabling and enhancing human capital. Acs and Szerb (2007) argue that middle-income countries should focus on increasing human capital, upgrading technology availability, and promoting enterprise development, and that it is important to start enterprise development policies early because the main drivers are perceptual variables that are difficult to change in the short run. In this case, the thesis agrees with the current MBC initiative through the NBP to increase human capital in Malaysia by introducing the Bill of Guarantees for the biotechnology industry. NBP eventually promotes biotechnology business through various programmes including the BioNexus and Biotechnology Entrepreneurship programmes. These programmes help generate new ideas with potential entrepreneurial activities and thus help increase the chances of translating potential business opportunities.

7.2.3 Sociocultural Forces

When Dr. Farminah was selected to establish Farmina, much was made of her position of counsellor, in which she plays an active role in the local community (irrespective of race), trying hard to support the cause of racial integration and creating harmony in society. This reflects her identity, as facilitating the society that badly requires her service shapes the way she behaves and the products that she later produced. It was through the dialogues and interactions with her patients that she extracted cues to help her decide what information is relevant and what explanations are acceptable (Salancick & Pfeffer, 1978; Brown et al., 2007) prior to producing the bio-mechanic based products from herbal extracts. The extracted cues and socially active interactions enacted potential business activities that later engaged her business collaboration with an established science and technology based university, UTM, and the Standards and Industrial Research Institute of Malaysia (SIRIM). It was also evident from the narratives and stories in the interview that Dr. Farminah was visibly aware of potential events/actions that were plausible to her and might present profit opportunities. She reiterates: *“The biotech industry actually has many opportunities but the Malays don’t want to take action. They would prefer to wait and see, look and hear. They don’t want to take action, be the player. They don’t want to be the player.”* It was what happened around her that initiated her action to enact activities that she deemed beneficial to her and her business. In other words, it was an ongoing process of sensemaking, in which she shaped and reacted to the environment she faced in order to enact opportunity. The analysis chapter is to look at how the sociocultural forces affect entrepreneurs in enacting profit opportunities. It is important to understand how entrepreneurs react and respond to these social forces and how these forces influence entrepreneurs’ product offerings and services. By combining prior skills and career experience in the fields of counselling and

psychology, it will not take long for a mentally alert person to sense and recognise profit opportunities to address these issues. Hence, Dr. Farminah narrated her story about the effect of social issues in society influencing the process of her building up new products and services for profit gain and profit opportunities:

I did charity work at Tampoi Hospital (the hospital comprises a care centre for psychiatric, psychiatric forensic, nursing, detoxification, geriatric and other services to patients and is the second largest psychiatric hospital in Malaysia), other hospitals, [and] welfare centres. So it was from those places that I had come up with a formula on how I would overcome stress – emotions, mental [issues] – and those products are actually biotech products, bio-processing products. With the plant, its original features are gone and yet it still maintains its medicinal values. An example that I am giving is Indian Pennywort (Pegaga). Indian Pennywort, after being processed through certain processes, loses its physical features but it maintains its Indian Pennywort medicinal values for children who are stupid and slow learners. I'd already done the action research and as well as clinical tests for no less than 12 years. So, I have full confidence [that] what I'm doing is very correct and helpful [to] many people. So from there, when it was taken a bit further into the manufacturing and entrepreneurship form, it expanded. And I have recently acquired a licence to be a franchisor company.

Case FBP (GF). Personal Interview. 3 February 2010, pp.6–7

The process of translating her ideas into tangible commercialised products is an iterative process. The step departs from her social and working interactions at the psychiatric hospital and thus continues while she was a counsellor. She then spotted the gap that exist during her treatment for socially troubled teenagers and then recognized that a treatment in the form of homeopathic vitamin is the answer to the issue. The learning process for her takes her almost 12 years of a clinical test to be done. Consequently, this was the next stage of her in which she is able to manufacture and sell the vitamins commercially after recombining her skills, experiences and collaborating with University of Technology Malaysia (UTM) to secure technical supports for her products. Dr. Farminah learns what she thinks she would like to offer, and she looks back over what she experienced before. This was the unexpected journey of a social process of opportunity enactment, which demonstrates what she says, that it is determined by various social factors. Dr. Farminah recalls her views as a homeopathy doctor:

Actually, as a homeopathy doctor, I know that lead poisoning will cause school children to act criminally or act antisocially or become naughty or have no manners. This is due to too much lead in canned food. In those dried fruits there is a lot of cadmium, a lot of mercury. I studied homeopathy [so] I know how to neutralise those substances in a person's body. I give remedies to neutralise those things, and for those youngsters, their minds become acute again, good again. Those who always fail could pass again. Actually, it is just a process that neutralises the disturbances that have happened to the students. But this is only for those who came to see me or those whose school I went to, to give talks. I'd give them treatment. The society has a problem. Let's say someone came to have a counselling session with me, right? The fellow would tell all and me that his mind is messed up that, so I'd bring in flower medicine. What flower is it? So, it is similar with healing. For example, a

lonely person comes in, or a person who is depressed, right? It's white in colour and there's only one flower [on the plant]. The extract is taken from this flower and is put in water or a tablet – [it is] the biotech process. It is truly amazing. Those people possessing extraordinary wild emotions would be given, uh, what do you call it, the herbal extract, and become happy and free, and become sincere.

Case FBP (GF). Personal Interview. 3 February 2010, pp.15 & 32

The case of Farmina implies that the entrepreneur creating markets is important, because not only do markets provide the basis for economic growth (and profit) but they are also a vehicle for social change (Read et al., 2011). Reading and interpreting Dr. Farminah's interview conversations clearly show the inclination of her framing entrepreneurship activities together with cultural values. This could be clearly interpreted from her detailed story below:

It started when, back then, perhaps by Allah's (God) will, I helped these problematic children – Chinese children, Orang Asli (aborigine) children, Malay children, who had never passed Bahasa Melayu (Malay Language) [subject]. And I was baffled, about what I had given [these children]. Consequently, the schools' records showed that these children passed with distinction. I was smiling to myself, "I should try. I should try." I sent [the formula] to the university, I sent it to SIRIM and SIRIM cooperated. When I think about it - that is why I do a lot of charity, I do free stuff a lot. You know I give a lot to schools – secondary schools, kindergartens, Arabic schools, Tahfiz (Quranic memorisation) schools. I give for free, you know? Because during my interview with MTDC [Malaysian Technology Development Corporation], they asked, "Dr. Farminah, if the government does a good deed to you, how would you repay it?" I called up unemployed university graduates [and] I trained them to do business for free. They go out and do business independently and the rest I give out to schools. That is my way of repaying the government's good deeds. I give free courses. I go to schools, to give talks. Can you imagine? I am a doctor, supposedly for two hours [of talks] I should be paid usually around RM1000. They paid just RM100! [Thinking to myself] the other RM900 I consider a gift and my way of giving back to society. Then, I am conducting this training – these industrial attachments for students, for 6 years for my company. Each year, we train no fewer than 30 students from universities. I wouldn't mind spending hours teaching them because I'm already feeling obliged. I've been helped [so] I must give back, the profit that I've gained from healing people just now.

Case FBP (GF). Personal Interview. 3 February 2010, pp.8–9 & 30–31

From this case, entrepreneurship, according to Dr. Farminah, is located in the heart of Islamic practice that promotes acts of helping the needy and contributing back to society. The permission and encouragement to engage in entrepreneurship or business-related activities are clearly mentioned in the Holy book of Quran. The following Quranic verse supports this: *'Allah has permitted trade (business) and has forbidden interest.'* Al-Quran 2: 275. The Prophet Muhammad (Peace Be Upon Him) expounded that nine out ten sources of wealth (or profit opportunity) can be found in business. This is by virtue of human nature and demonstrates that people are always interested in profit opportunity, and entrepreneurs are *'khalifah'* or leaders and have responsibility for developing prosperity, seeing business as part of *'ibadah'* or a good deed. Part of performing a good deed is to share part of the earned profit for the benefit of society, as narrated by Dr. Farminah about her role in helping

people from different parts of society to achieve a balanced life through her biochemical homeopathy products. Researchers point out that commercial entrepreneurs are primarily concerned with private gain and economic wealth (Austin et al, 2006; Dees, 2001). Entrepreneurship activities that embed social and spiritual causes, on the other hand, are deeply involved in achieving social benefits; their primary purpose is to promote social causes. For the most part, scholars seem to agree that a social enterprise has a primary focus on impacting the social sector. To quote Mair and Marti (2006), “Rather than profit versus not-for-profit, we argue that the main difference between entrepreneurship in the business sector and social entrepreneurship lies in the relative priority given to social wealth creation versus economic wealth creation. In business entrepreneurship, social wealth is a by-product of the economic value created; in social entrepreneurship, the main focus is on social value creation.” In recognising and creating business opportunities, Dr. Farminah engages herself with the social value creation; in one way or another she felt an obligation to help people in need of her service.

7.3 Case 3: Invitro Tech

7.3.1 Individual Forces

7.3.1.1 Passion and Prior Knowledge/Experience

Invitro Tech was first involved in R&D and later, in 2007, it transformed into a commercially operated business under the leadership of Mr. Shukri. Looking at the character of the owner of Invitro Tech, it is sensible to suggest that Mr. Shukri's identity and his business identity were influenced by his prior knowledge and working experience in the retail industry. In a retrospective of sensemaking, to understand what Mr. Shukri thinks, he looks back at what was said. What he said is shaped by the process that was affected by various social factors such as his educational background, knowledge and experience prior to his business venture. For example, Mr. Shukri was a business management graduate who was involved in the corporate sector. He made an outright business and technology purchase and later proposed that the company be commercialised. Having worked in the retail industry for years, he extracted cues from the retail context to help him decide what information is relevant and what explanations are acceptable (Salancick & Pfeffer, 1978; Brown et al., 2007), with the expectation and perception that both industries, biotech and retail, were the same. Mr. Shukri demonstrates in the interview dialogues his philosophy of being as meticulous in managing the biotech venture as in managing one in the retail industry. He shares his views:

Retail is detail, right. It is quite detailed over here. And I look at things from a different perspective, as compared with my technologies. We now have five researchers, so-called researchers. We have one economist. So all these, they look at things from a technical perspective.

Case IVT (GF). Personal Interview. 23 February 2010, p.7

It is clear that Mr. Shukri's identity influenced his business identity and it was convincing and logical for him to apply a similar set of strategies to a different context, the biotechnology business. His action was known as 'practical theory' (Rae, 2007), a representation of knowledge of 'what works, why, how and with whom', gained from contextual experience, intuition and sensemaking. In the case of Invitro Tech, Mr. Shukri demonstrates his identity and role in the transformation process, when he transformed the existing culture among his many employees to the values of biotechnology activities as business rather than research/technical per se. This was one challenging task that Mr. Shukri successfully achieved and it was clearly regarded as a success. From the research interview conversation, it was evident that his prior knowledge and practical experience in several big corporations increased his chance of success in the transformation process. Mr. Shukri recalls,

We have to tune them (technical staff in his company) to balance between technical and business. Too inclined towards technical, uh, it is not acceptable. We are going to be cost-centred rather than profit-centred if we do that.

Case IVT (GF). Personal Interview. 23 February 2010, pp.7–8

So, the transformation process he led was from a purely R&D company to a commercially driven firm via identity change. The interpretations from the interview with Mr. Shukri signify that change was essential to focus the company, so that technology was not only seen as technology per se but it was also viewed as part of the business. Hence, the existence of technology should fit the existence of the business with the aim of creating better values. He changed the identity of a business that was focused merely R&D of technology into the concept of technology for business. Mr. Shukri posits, "*To me really it's just a business, not biotech. I don't regard it as a technology, but everything is, what do you call it, business.*" Mr. Shukri elaborates further in his story:

We have to improvise. We have to refine – because now it's no longer the technology in the sense of R&D. It has to be applied R&D. When we refine the technology, it has to suit our commercial application. For example, you can spend millions on R&D, but when you translate it into commercial production or whatever thing, you know whether that technology will fit to your business environment, and it's a different matter.

Case IVT (GF). Personal Interview. 23 February 2010, p.15

However, Mr. Shukri was faced with *emotional labouring*³⁶ in reconstructing logical and convincing arguments to make sense of what he felt should be done at Invitro Tech, to balance the technical and business perspectives. He argued that the company would end up being cost centred rather than profit centred. Mr. Shukri tried to construct meaning and negotiated a joint action. He convincingly tries to communicate and construct a balanced working environment in his organisation:

For our researchers, I don't do purchasing for them. I try to teach them to source at the best price. It's a learning process indeed. Because if not, they try to get the best equipment, they try to get the best chemicals that money can buy, in order for them to get the best result, for example. So, all those have to be changed, definitely, if they want to be in the business environment. The job is to convince the technical people to do it the way production should be. Because what I am doing now – it's no longer a tissue culture laboratory. It's production, a commercial laboratory. So everything here follows specific standard operating procedures (SOP).

Case IVT (GF). Personal Interview. 23 February 2010, p.18

Mr. Shukri claims the easiest way to address this issue was through “*dollars and cents*”. In the case of Invitro Tech, he foresaw the need to educate his technical employees on the need to be balanced in their thinking towards a shared vision of the organisation. He shared his concerns about the complex nature of the biotech business and what might affect him in discovering and creating potential business opportunities. The story below explains this:

Because it is very difficult, you know. I foresee this is going to be a very difficult venture, doing this, especially in biotechnology, due to its long gestation period. When – because you are dealing with living things, you know? You plan, but because of living things, it's not like a normal production line; you input, you get output. Input, output. Here, input, but probably you don't get output. Input, you probably don't get output tomorrow but it's going to be another week, two weeks, even months, right? They say, you are venturing into uncertain territory. Financially, it is very tough. Even now also it's quite tough because we are like two and half years old. You know, when you're talking about being incorporated, that was in 2005. But when I took over it was 2007. We start moving here in May 2007. So it's about two and half years indeed that we've operated commercially. Like I told you just now, the gestation period for the biotech industry or what we are doing now is very long. When you start initiating something, it can range between one and a half years to two years until you get – so, financially you can imagine during that one and half years, two years, the amount of money that you need to, to pump in, you know, to make this thing happen, because no matter how, you have to produce.

Case IVT (GF). Personal Interview. 23 February 2010, p.8–9

Nonetheless, Mr. Shukri responded on extracted cues. The stories and narratives show his alertness to extracted cues from various sources such as market research information, potential opportunities and trend patterns. Mr. Shukri realised the importance of focusing on

³⁶ A situation where entrepreneurs 'manage' their feelings and emotions as they adapt or orientate themselves in the new setting (Fletcher, 2011)

the banana crop to increase the income of his company, as Malaysia has 30,000 hectares planted with bananas. He argues that if 1 hectare is planted with 1,500 bananas, thus for 30,000 hectares, the market would require approximately 45 million banana plantlets. He reiterates that at present there are only 1 or 2 players (business competitors) who are producing banana plantlet tissue culture. From relevant market signals, the respondent sensed that banana tissue culture would serve as a technology to be used in the biotechnology industry, facilitating productivity and enacting a business opportunity (Shane, 2003), 'a situation in which a person can create a new means-end framework for recombining resources that the entrepreneur believes will yield a profit'. Mr. Shukri recalls, *"Before this, they (the farmers) used to plant one hectare and they'd yield five tonnes. In 2007, one hectare yielded ten tonnes."* Hence, individual alertness supported by the relevant information from the market research fills the demand gap in the agri-biotech context, shaping Mr. Shukri's strength to recognize and create business opportunities. Making sense of Invitro Tech's case, substantively, every single entrepreneur offers a fascinating story, interweaving personal aspirations and social context, and these stories offer a rich source for identifying meaningful patterns (Dimov, 2010). In this regard, at the level of individual entrepreneurs, opportunities represent venture ideas (Davidsson, 2003), enacted possibilities for economic gain (Dimov, 2007), a stream of ideas modified as the entrepreneur's act (Dimov, 2007b), creations from the entrepreneurs' actions (Alvarez & Barney, 2007), or organising visions (Lichtenstein, et al., 2006). Notably, these views do not differ from Klein's (2008) notion of opportunities as imagined, and from Shackle's (1955) idea of entrepreneurship as action in pursuit of imagination. Nevertheless, from the point of view of the individual entrepreneurs, the future is not known or predetermined (adding emphasis to the Invitro Tech case, venturing into uncertain territory), and so they act on what at that moment are their beliefs about what the future might be (Dimov, 2010). The success of each and every individual person in the pursuit of business opportunities differs, and one method that works for one may not be presumed to be successful for the others.

7.3.1.2 Business Networks

To identify opportunities for viable new ventures, entrepreneurs must somehow perceive, gather, interpret, and apply information about specific industries, technologies, markets, government policies, and other factors (Ozgen & Baron, 2007). While, valuable information obtained through formal and informal networks allows greater opportunities for entrepreneurs to secure immediate and first-hand information that can be translated into profit opportunities, before other people could possibly sense it. The case of Invitro Tech demonstrates the role of Mr. Shukri's wife as a 'negotiator', instrumental to their business, by

connecting him to her wife's former lecturer (professor). The professor was the CEO of the Melaka Biotechnology Corporation (a company based in the Malaysian state of Melaka). Knowing the CEO personally helped Mr. Shukri to gain considerable advantage over other people, as the relationship tended to be more informal and trust had been developed earlier through the student–lecturer relationship. It allowed Mr. Shukri to gain access to valuable information and networks to uphold his professional competence and he developed market linkages, translating them into potential business opportunities. The social relationship that developed from the student–lecturer relationship then further expanded into a business–university collaboration, when the CEO left the Melaka Biotechnology Corporation to join the University of Science Malaysia (USM). The technical–business collaborations between USM's business arm, Sanggar Science, and Invitro Tech enable the company to gain access to various research grants and technical support given by the government through USM, enacting collaborative advantage (Johannisson, 1998). Mr. Shukri recalls:

So we want to refine, try to get them to be a liaison, I mean, between industry and research, or industry and university. It is much easier, rather than, let's say for example, for us to get things done as a company, privately, a totally private company, to get things done, to get the company to do things for us. But if there are entities joining us or having a JV (Joint Venture) with us or whatever thing, it's much easier, I mean, the red tape.

Case IVT (GF). Personal Interview. 23 February 2010, p.27

The significant roles of university and business, communicating and engaging closely to create sensible impacts on business opportunities perhaps signifies Johannisson's (1998) statement on the inter-relationship of a network: *We all have a network. A person's self-image determines what connections are established and her/his network shapes the person's identity. Each and every tie is thus unique.* (p.299). Apparently, Mr. Shukri's personal network was unique and from his story it is clear that he tries to connect to the closest possible network from him through his wife's network circle. While benefitting from his wife's personal contacts, he also makes use of his wife's knowledge and background in biotechnology, through which he might have gained considerable information and cues about the biotechnology venture. This represents his ability to combine and frame various cues and messages from different key resources to interpret and decide on any potential business opportunities. However, Mr. Shukri's limitation lies on his educational and working experiences in retail in which differs from biotech. This might influence his ability to connect well with various relevant agencies within biotech in Malaysia to secure additional institutional supports.

7.3.2 Institutional Support Forces

The institutional environment determines the formal and informal rules of the game, places constraints on human action, and, possibly, reduces uncertainty (Minniti, 2008). Entrepreneurship is the mechanism through which economic growth takes place, but institutions (such as the policy environment) are what direct entrepreneurial efforts towards productive or unproductive activities, by influencing the relative incentives and pay-offs offered by the economy to such activities (p.781). However, it is not clear whether government policies could shape institutional structures (institutional actors) for entrepreneurial action. At least, in the case of the Malaysian biotechnology industry, it signals the opposite. For example, in the case of Invitro Tech, in spite of obtaining seed fund grants (RM2.2 million) from MBC for machinery and laboratory equipment and a MARA loan (RM1.5 million) to facilitate business operations, Mr. Shukri shares his concerns on this issue:

One thing I see they don't have – you know, they are talking about biotechnology, but in their department, they don't have someone who is well versed in technology. I mean, again, let's say for example if you go to your bank, how many understand tissue culture? They talk about tissue. I come across people saying, what, "tissue paper", they say. To secure a loan is very difficult. I mean, for example, I made a proposal to MARA, sent an application; it takes them a year to approve it. So, you're talking about technology, you know? In a year, technology is obsolete already.

Case IVT (GF). Personal Interview. 23 February 2010, p.21

The story communicated here suggests that government initiatives to increase entrepreneurial activity often do not seem to be informed or to be welcomed by entrepreneurs themselves. Furthermore, there is an absence of dialogue in the top-down relationship between government and entrepreneurs, for example in the ways in which small business support programmes is constantly changed by governments (Rae, 2007, p.35). If policy goals are stated, they are inconsistent and sometimes contradictory (Storey, 2000). As a result, efforts by government to aid entrepreneurship have not been especially effective, and evaluations have been characterised more by hope and puffery than by serious analysis (De, 2000; Storey 2000; Blackford, 2003). However, looking at two major funding grants received by Invitro Tech, it would be too extreme to suggest that the Malaysian government is ineffective in its biotech policy, and the policy and the industry in Malaysia are as yet only at the infancy stage.

7.3.3 Sociocultural Forces

High levels of trust imply a strong confidence in partners' benevolence, ability, and integrity (Mayer et al., 1995). In trust, fulfilling one's obligations is a demonstration of benevolence, not a plan to obtain tangible benefit (Nguyen & Rose, 2009). The other two elements of trust – ability and integrity – are also not demonstrated in social relationships (guanxi) (p.170). Mr. Shukri's ability and integrity in personal and formal relationships prior to his business perhaps represent the acts of goodness that fuel positive and strong relationships and in return increase the confidence of his partners/friends to support him with the lab construction. Mr. Shukri recalls the story behind this issue: *"It was difficult to gain trust from the financial institutions because they know this is a risky business. The payback period is a bit long indeed. There's always a risk involved, indeed."* Success in building positive relationships is one critical factor in supplying entrepreneurs with valuable resources and networks that could eventually be translated into financial resources. Partners (friends) could also work together to solve problems and to develop each other's capability (Hagen & Choe, 1998). Mr. Shukri demonstrates business plausibility, in sensemaking, the art of creation convincing and logical arguments through dialogues and narratives. Mr. Shukri claims his business was the result of family support, motivation and financial assistance. He posits that without all the financial supports, the business might suffer. He eventually enacted and secured trust among other institutions/business and friends. Mr. Shukri says;

They have trust in the way I negotiated with them or what, I don't know. It's a truth that I completed this. We completed this lab, it cost almost RM1.5 million. With all the equipment, the lab facilities, you know? I didn't pay a single cent to the supplier. Only in May, when MARA disbursed the money. But thanks to Allah (God), we managed to get this done without any money. But I'm taking a risk, but it's a calculated risk.

Case IVT (GF). Personal Interview. 23 February 2010, pp. 23–24

Institutions reduce variability in exchange by creating guidelines and norms of behaviors. Institutions facilitate trust development by encouraging trustworthy behavior between partners in a given situation (Zucker, 1986). When two parties enter an economic exchange, they should have clear-shared understandings of acceptable and unacceptable behaviors, whether these behaviors are explicitly written down in their contract or implicitly understood as social norms (Nguyen & Rose, 2009). They should also understand that breaking their obligations in the exchange would subject them to legal and/or social sanctions (p.168). These shared understandings, facilitated by institutions, encourage trustworthy behavior, which leads to trust between the partners (Hagen and Choe, 1998; Hardin, 1991; Shapiro, 1987; Zucker, 1986). While, entrepreneurs such as Mr. Shukri benefits much from trust between partners and was able to recognize and create more opportunities for his business.

7.4 Conclusion

This chapter presents that entrepreneurs accumulated a valuable amount and range of work experience (Romanelli & Schoonhoven, 2001), enabling them to access a broader and more useful store of remembered information than those entrepreneurs with narrower experience. Additionally, entrepreneurs extract cues from the social learning experiences they gained while working in several companies and was able to recognise the key decisions and business networks which would help them to face competitive challenges. In explaining the theoretical framework of the thesis, passion arouses interest and in most cases drives positive effects on entrepreneur's business ventures. The outcome of the findings demonstrates that entrepreneur's interest in certain activities such as reading, research and documentation of ideas had a range of positive effects, including enthusiasm, joy and passion. These effects shape the entrepreneurial process drives entrepreneur's emotional resources to cope with existing challenges. Aside from the individual forces, institutional support also plays a vital role in the sense that it provides entrepreneurs with a platform while lessening some of the burdens that can hinder their business ventures.

There was evidence of institutional intervention in all government funded cases, whether at federal government, state or local level, complementing Minniti's (2008) argument that formal and informal support mechanisms (for example, chambers of commerce and training programmes), publicly sponsored incubators, and, most of all, science, technology and research parks have a significant influence. Connecting to the theoretical framework, the institutional supports for government funded entrepreneurs help facilitate government's ambition to grow biotech industry in Malaysia. Hence, the interventions in the forms of policies or support mechanisms help address the serious challenges (Frost & Sullivan, 2009), of political, socio-economic and environmental factors, that might hinder its biotech aim for Malaysia. The contributions of chapter seven is summarised in the below Table 7.2: Summary of Contributions of Government's Funded Entrepreneurs.

Table 7.2: Summary of Contributions of Government's Funded Entrepreneurs

	Innobiologics	Farmina Bio Plus Industries & Consultants	Invitro Tech
Individual Forces	The conflict the respondent's experiences increases the feeling of	The findings suggests that passion in reading and research activities reflects the	The alertness of the respondent to extract cues from various sources such as

	<p>perceived self-efficacy³⁷, which Lee et al. (2011) argue could strengthen the relationship between low job satisfaction and entrepreneurial intentions. The personality and business identity of the respondent conform to the notion that, employees who are confident of their job skills may be more motivated to leave their companies to start businesses, if they experience low job satisfaction.</p> <p>Networks, personal or formal, expedite the supply of information to entrepreneur. The respondent secures the possession of networks through trust and attracting valuable information and key individuals to facilitate his business.</p>	<p>respondent's interest in increasing her knowledge; while passion can fuel motivation, enhance mental activity, and give meaning to the everyday work of entrepreneurial activities.</p> <p>This case presents how family serves as the role model in business, thus shaping the respondent's business identities and actions.</p> <p>Additionally, curiosity leads to innovation and so, in some ways, can open up potential business opportunities.</p> <p>In the context of business networks, the greater the extent to which entrepreneurs have mentors and informal industry networks, and participate in professional forums, the greater their alertness to new business opportunities.</p>	<p>market research information, potential opportunities and trend patterns, drives the respondent into opportunity discovery and creation process</p> <p>The success of each and every individual person in the pursuit of business opportunities differs, and one method that works for one may not be presumed to be successful for the others.</p>
Institutional Forces	<p>Instead of general policies that focus on the small business sector as a whole, policies can also target specific sectors, regions or groups. Some of these policies include different groups of people, different sectors of industry.</p>	<p>The introduction of DEB (<i>Dasar Ekonomi Baru</i> or New Economic Policy) was intended to allocate productive activities and policy strategies to enable the majority Malay population to move out of poverty. This has shaped to the birth of Farmina³⁸, aimed at engaging the Malay majority to start a</p>	<p>The finding indicates that it is not clear whether government policies could shape institutional structures (institutional actors) for entrepreneurial action. In the case of the Malaysian biotechnology industry, it signals the opposite. If policy goals are stated, they are inconsistent and</p>

³⁷ Bandura (1994) defines people's beliefs in terms of their capabilities to produce designated levels of performance that exercise influence over events that affect their lives.

³⁸ Formed through the Malay-Chinese Entrepreneurial Gap Reduction Program.

		business for a living for the purpose of maintaining peace in the society.	sometimes contradictory.
Sociocultural Forces	The findings presents that the respondent's management style in Innobiologics was based on cues ³⁹ extracted from practical experience he accumulated over years when serving as a sales manager, an ongoing process that simultaneously shaped his business identity.	The findings in this case suggests that entrepreneurship is located in the heart of Islamic practice that promotes acts of helping the needy and contributing to society.	The finding demonstrates that trust is crucial element in opportunity discovery and creation processes. Institutions facilitate trust development by encouraging trustworthy behavior between partners in a given situation. While, the respondent benefits from the trust he shares between partners to recognize and create more opportunities.

The next chapter eight examine the interplay of sensemaking notions in the process of opportunity discovery and creation processes of the entrepreneurs. The analysis departs from the interpretation/analysis of the interviews conversations.

³⁹ Evidenced by the fact that he reacted and took action based on precedence over accuracy.

Chapter Eight

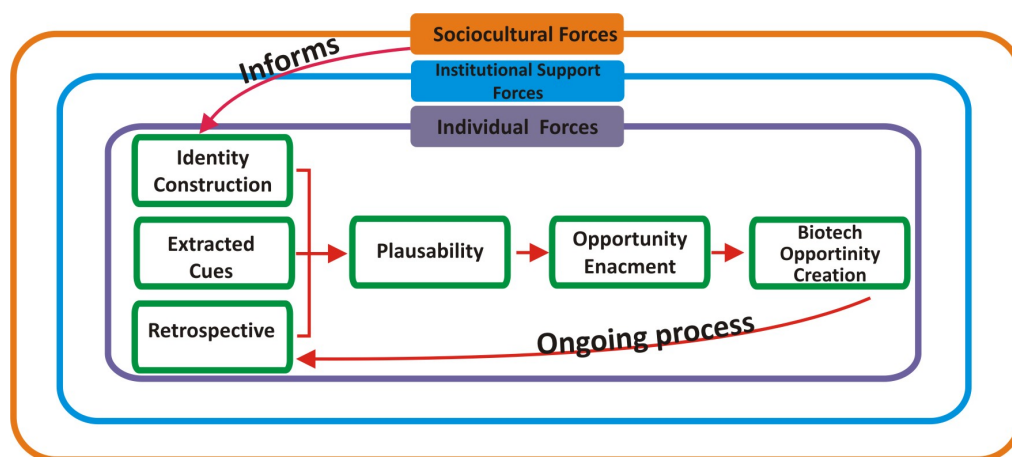
Discussion and Theorisation

8.0 Introduction

This chapter presents the comparative case analysis of biotech entrepreneurs in Malaysia. This study examines how the key themes interrelate with the sensemaking concept. The in-depth analysis in this chapter explains how the individual entrepreneurs recognise or create opportunities from the sensemaking perspective. The case analysis centres on three different cases of family funded, personally funded and government funded biotechnology entrepreneurs in Malaysia. The first case is Power Biotechnologies (PBT), the second is Rrass Bakti (BRB) and the last is Innobiologics (INB). They were all selected based on certain identified characteristics that enable the researcher to analyse more deeply the phenomena of opportunity discovery and opportunity creation – as discussed in chapters 5, 6 and 7. The two criteria shaping this case selection as discussed in Chapter Four and Chapter 7 are: firstly, agreement by and access to the respondent's and secondly, the nature of the entrepreneur's active and long involvements in entrepreneurial activities such as business involvement, prior knowledge and career experiences.

8.1 Examining Entrepreneurship through Opportunity Framework

The concept of sensemaking, through the narratives of spoken, written and personal observations, is used to understand the phenomena of opportunity discovery and opportunity creation of biotechnology entrepreneurs in Malaysia. Malaysian entrepreneurs, as with entrepreneurs in other areas, construct opportunities and acquire technology to manage and deliver their plans into actions. The theoretical framework outlined below in Diagram 8.1 demonstrates that entrepreneurs shape entrepreneurial opportunity through the process of identity construction, making sense of extracted cues from the environment and refining retrospective elements in making continuous and critical decisions.



Entrepreneurial Opportunity Creation

Diagram 8.1 Theoretical Frameworks

The above framework explains that individuals construct their identity, and thus their venture’s identity, during opportunity discovery and creation processes. The individual presents the ability to perform different roles of knowledge acquisition through reading, researching, and personal observation to acquire relevant and valuable information extracted from the surrounding environments. Following this, the stage of enactment captures the individual process of discovering and creating opportunities within the environments that entrepreneurs face in the form of dialogues and narratives/stories. The enactment stage, outlined in the model, is on-going processes in which the individuals simultaneously shape and react to according to the environments they face. The flow of these processes signifies inter-dependency and an iterative process in which all three forces complement the sensemaking notions, for example the development of the individual’s identity or the venture’s identity is influenced by the values and belief systems of the society. This means that, these systems influence an entrepreneur’s thought and identity in which certain values are considered business norms in the society. My study is about how and why entrepreneurs discover/create opportunities. This means that the study shows how entrepreneurs relate to and enact their culture, religion and identity. Weick’s (2001) sensemaking theory is applied to study entrepreneurial issues in the fieldwork of three biotech cases in Malaysia. Analysing how the elements of identity construction, extracted cues, retrospective, plausability, opportunity enactment and the on-going social process affect opportunity creation shapes the framework.

8.2 Identity

The concept of internal self-identity demonstrates the character that the individual takes himself or herself to be (Watson, 2009). Identity in this chapter presents entrepreneurs views of themselves as unique individuals. Additionally, key characteristics of entrepreneurs, including their values and beliefs about who they are as an individual and as a social actor, are imprinted on the ventures they create (Bettis & Prahalad, 1995). Consequently, 'who the entrepreneur' is likely to shape what the venture becomes; prior knowledge and work experience that considers only the founder role identity captures important personal and holistic aspects of the self that impact the entrepreneurial process. Identity work involves individuals forming, repairing, maintaining, strengthening or revising their identities (Snow & Anderson, 1987; Sveningsson & Alvesson, 2003). Studies of the role transition process, for example when becoming a manager, show that the changing configuration of relationships that accompany a work role change can also prompt enduring changes in identity (Hill, 1992). This is evidenced in the case of a government-funded individual who was supposed to be serving as a lecturer at a local university in Malaysia. Serving only a few years after completing his doctoral study, he then realised that his passion was not in teaching; he later joined a private biotech firm. He explains:

In 1986 I was recruited as Assistant Lecturer in the Universiti Teknologi Malaysia (UTM). I was interested in biotech. I pursued a Masters in the University of New South Wales and then, with strong results, I got a scholarship to continue on with the PhD in the University of Queensland. Then, after graduating, I got my PhD. Unfortunately I did not see my career progressing in academia, so I decided to resign and join the private sector. So I joined B. Braun Medical [an international company dealing with pharmaceutical and biotech products] as a Sales Manager doing technical sales for Biotech Division and B. Braun Medical. It was a disappointment at a university. I was telling myself, "Look, I am not feeling good about staying in the university," because of some issues about the appointment of a professorship I was not happy with or the way it was handled. To me it doesn't look clear enough; my argument especially was, they keep changing the goalposts. That is not something that I'm happy with. I'll probably think about myself.

Case INB (GF). Personal Interview. 11 February 2010, p.2

8.2.1 Identity and Entrepreneurial Passion

In the above story of INB, the respondent felt there was no movement in his academic career, and he was disappointed at the way he was treated at the university. The '*not feeling good*' notion in the institution was not correlated with his entrepreneurial passion for promoting intense, flow-like states of total absorption in one's activities (Csikszentmihalyi, 1990); instead the disappointment stimulated the motivation of the INB respondent to make a career change. Professional identity often plays an important role in decisions, especially

important life decisions such as starting a new career in entrepreneurship (Read et al., 2011). Nevertheless, this is the change of entrepreneurial passion, to form an identity of being hard working and having the ability to learn whilst he was serving several biotech firms. At this stage the INB respondent was focusing on activities in which he had invested time and energy and that he found important to his career and life. For example, he acknowledges the valuable learning lessons of managing his sales department on a profit and loss basis while serving with B. Braun Medical. Literally, this was something new to him (the INB respondent), someone with pure technical biotechnology background acting the role of sales personnel. Rae (2007) argues that people develop their identity from their activities, practices, and roles in social interactions. Hence, when activities, practices, and roles in social interactions change, a newly built identity emerges. Capability also influences one's identity. As identity carries different roles and practices it develops with the passage of time. During the time when the respondent of PBT was working for a government-linked corporation in Johor (a state in Malaysia), as a chief researcher there he was able to use massive financial and social capital resources from the company. Apparently, when he left the institution and created a small family owned business, he suddenly realised that he needed to use limited resources to run his business. His role has changed from a chief researcher in the former corporation to a family business biotech entrepreneur with limited financial and social capital, having to organise and allocate these resources effectively.

Reflecting on his business's limited financial strength, the respondent decided that the technology from India produced an output as good as that from Japan, at a competitive cost. The respondent further reiterated that his firm does not have the ability to pay big salaries and provide luxury cars or a big factory. PBT represents the philosophy and true meaning of entrepreneurship – to struggle and to succeed. The respondent from PBT differentiates his business from other biotech companies by keeping costs lower and he made efforts to demonstrate to his staff that his business approach portraying a positive, sacrificing, hardworking, and therefore trustworthy, character:

That's why in Malaysian Biotech, the policy that they fail to understand, that to really be an entrepreneur, we had to struggle to start. Not simply apply for [grant/funding] every time your [resources] are running low. A couple of companies are like that. This is not a true one [entrepreneur]. This is artificial [entrepreneur].

Case PBT (FF). Personal Interview. 11 February 2010, p.12

In this respect, the PBT entrepreneur distanced himself and his business identity from others whom he did not regard as true entrepreneurs with sound and solid businesses model. According to Dr. Nasir (PBT), a true entrepreneur has a strong personal identity and is able

recognise business opportunities to create business value. For example, he cited his success in building additional factories upon receiving financial support. In the case of another personally funded business, BRB, the respondent believed that his personal interests for science, reading, gardening, and research were all vital parts of his 'emotional resource'. In this case, entrepreneurial passion facilitated the process of idea generation that can lead to important cues from the surrounding environments. Cues or information extracted from sources such as reading, social interactions, and research may help entrepreneurs to identify interesting ideas that could be transformed into potential business opportunities. These sources of cues may literally fuel the emotional journey of BRB respondent's business opportunities.

My mind mostly likes to talk to plants. Those who do not know might say I am crazy [laughs]. I am more into gardening in my free time. Because first, I need what do you call it, that energy flow, right?

In-depth interview. BRB. 6 October 2010, p.59

8.2.2 Identity as Evolving Process

In brief, individual identity is understood as "a dynamic, multi-layered set of meaningful elements deployed to orientated and position one's being in the world" (Karreman & Alvesson, 2001: 64). This invokes the concept of individual identity as constructed, multiplicitous, and evolving rather than fixed, coherent and stable (Mead, 1934; Kreiner et al., 2006). Identity work is succinctly stated as that which "concentrates on actors' efforts to create a coherent sense of self in response to the multiple and perhaps conflicting scripts, roles and subject positions encountered in both work and non-work activity" (Kuhn, 2006:1341). In the analysis of PBT case, social learning is an integral part of entrepreneur's identity thus is enriched through the process of learning from cultural assimilation. For example, in Malaysia, where the Chinese community is well positioned in business activities, the other major communities such as the Malays try to emulate Chinese business values. Hence, the entrepreneur's venture identity is enriched in the process of socio cultural interactions. Personal and social emergence is the development of entrepreneurial identity expressed through a person's narrative or life story (Rae, 2007) and this is evidenced in the case of BRB

"I befriend a lot of Chinese. The time factor is more important because our folks say, "Time is gold." So, sometimes it's not the money that is gold, its time that is gold. So when a person is involved in business, they have to be cautious with time; the time factor is the most important. Let's say, dealing with clients, let's say the time you showed up is OK, punctual. You said 1.00 pm, you arrived at 3.00 p.m. That is in the form of you wanting to meet me."

In-depth Interview. BRB. 6 October 2010, p.8

The analysis in this chapter suggests that entrepreneurs engage in an evolutionary transformation of identity involving creativity and research skills. The search and research process allows more room for interactions that stimulate critical mental alertness, increasing the chance of an individual to be innovative. While, innovative activities help translates actions into profit opportunities. This is explained in the interview with BRB respondent.

I am more towards my creativity; I do a lot of, what do you call it, searching. So, sometimes through reading and all that, I'd do research. I'd do research in terms of facts of the world itself. Let's say that I saw that the bird is big, it's like the aeroplane, and it's using the fans. This particular bird, on the other hand, uses wings like this. What is the strength of these wings when compared to the fans? I'd research using my brains, you know? The bio manufacturing in terms of fertiliser, I did the research. This is because sometimes I'd read a book and then that day I'd go to Japan, so I did manage to ask the professors how things like the effective micro-organism came into being like this. Initially, I had a bit of knowledge on bio. I went to the Hiroshima Museum in Japan. I read a lot of the data that I had managed to see and all that it said was that when Hiroshima was bombed, they treated the soil environment with some sort of bio.

In-depth Interview. BRB. 6 October 2010, pp.15-16

Creativity describes ways of seeing problems not as difficulties but merely as possibilities (Puhakka, 2011). It is a chain of thinking in which are connected imagination, inventing, newness, cleverness, insight, intuition, inspiration and illumination (Henry, 1991). In BRB case, entrepreneurs (the respondents) are not necessarily different from non-entrepreneurs in traits, but they do think differently. Consequently, it is possible to argue that they see business opportunities better than non-entrepreneurs because they cognitively process information related to opportunities in a more "open-way" (Puhakka, 2011). Palich and Bagby (1995) suggest that entrepreneurs may simply frame the same stimuli differently than non-entrepreneurs. While this reflects the ability of the BRB respondents to process useful cues and information, framing the stimuli and translating the problems into business opportunities while they were on a visit to Japan. Generally, in analysing identity, the comparative element is identified in the comparison of family, government funded and personal funded firms. The examples are summarised in Table 8.1 as follows;

Table 8.1 Table of Cases Comparison on Identity Notion

	Opportunity Driver	Summary of Belief	Outcomes
<u>Government Funded (INB)</u>	Route for career change	Entrepreneurship provides the freedom to choose individual own tasks and what he/she should aim for	Professional Identity Changes
<u>Family Funded (PBT)</u>	Mobilisation of Resources	Entrepreneurship is a way to fully integrate individual's prior knowledge/values into their business venture	Identity construction
<u>Public Funded (BRB)</u>	Entrepreneurial Passion	Entrepreneurship is a way of shaping entrepreneurial passion into opportunities	Identity as evolving and dynamic

Table 8.1 demonstrates that entrepreneur's identity is shaped through the opportunity enactment process. This includes the evolutionary process of entrepreneur's career change, producing business outcomes from limited resources and mapping entrepreneurial passion into business opportunities.

8.3 Retrospective

Sensemaking is on going and retrospective, making sense of what has happened (Gioia, 2006; Weber & Glynn, 2006; Weick, 1995). Hence, individuals make sense of what people have said and done and therefore cannot make sense about what has not yet been said or done (i.e., the future). Sensemaking involves the on-going retrospective development of plausible images that rationalized what people are doing (Weick et al., 2005, p. 409). Additionally, individuals consider and contemplate the conversations, evidences, and events and try to make sense of them. It is the process of attending to that which has occurred, looking back from the now to the past, recognizing that it is subject to the fallibility of memory, and [that it] can be very misleading (Weick, 1995). From an entrepreneurship perspective, Puhakka (2011) argues that the elements constituting opportunity creation are the entrepreneur's creative cognitive process, internal creative qualities, environmental conditions supporting or hindering creativity. Puhakka posits that the interaction of these elements, have a significant impact on the innovativeness of business opportunity. Kaish and Gilad (1991) also suggest that entrepreneurs recognise business opportunities by gathering information from multiple sources and interpreting it with fluency. Human beings use a variety of strategies for dealing with the volume and complexity of sensory information streaming in from the world (Valliere, 2011). Further, Weick (2001) claims that the whole recipe works only if individual produce some object in the first place that can be scrutinised for possible thoughts and feelings.

8.3.1 Retrospective and Alert Entrepreneurs

Alert entrepreneurs have internal and external capabilities, i.e. intellectual and social capital, to be ready for opportunities (Puhakka, 2011). More importantly they are capable of transforming pieces of information into a concrete solution (Anokhin et al., 2009; Zahra, Korri & Yu, 2005). To learn what the entrepreneur thinks, it is useful to look over and interpret what they have said earlier, a notion of the retrospective entrepreneur. This is by recognising, reading, and interpreting various statements or stories that provide cues to what has been said about their prior knowledge and career experiences. This is evidenced in the stories of the BRB and PBT cases:

I worked with the Agriculture Department before this for 30 years as an agronomist. At that time there was no MARDI⁴⁰ yet. So, I was in Agronomy, where I was more on research such as fertiliser trials, variety trial in that department: I did those. So, right there was where I gathered my experience, and one day I had my own vision while I was working. So I worked until I was 50 years old. I tried to get out from the department to – what do you call it – do business. So, it was there that I had gained an idea where the product that I had wanted to make had already been – what does people say – in store within my own self.

In-Depth Interview. BRB. 6 October 2010, p.2

But Omar and myself have been in the biotech business for more than 10 years but because we had the opportunity, we formed our own company. So, you can see from the logo there that this has BioNexus status. Any biotech company must have this licence.

Personal Observation Transcription, PBT, 6 October 2010, p.6

In the case of BRB, it is reasonable to understand that with his 30 years' experience as an agronomist with an agricultural government department, the entrepreneur might have accumulated sufficient technical knowledge, although perhaps not business acumen. Thus, his story posits that he uses his internal intellectual knowledge with his circle of social and business networks to sense profit opportunities. However, the whole recipe works only if one produces some object in the first place that can be scrutinised for possible thoughts and feelings (Weick, 2001). This is evidenced in his vision that transpires from the statement "the experience that I had gathered which one day, I had my own vision while I was working. So I worked until I was 50 years old. I tried to get out from the department to do business". Retrospectively, the vision to create his own business did not happen suddenly; it was carefully articulated in his 30 years of working for the government. This is also evidenced in a statement analysed during a personal observation of a business meeting between PBT and their Vietnamese clients in the office in Johor, Malaysia on 29 September 2010 (11.30 a.m.). The meeting was mainly to present to the potential client from Vietnam and convince

⁴⁰ MARDI was created with the main aims of generating and promoting new, and efficient technologies towards the advancement of the food, agriculture, food and agro-based industries.

them to purchase and operate PBT's technology in Vietnam, for the purpose of transforming solid wastage into composite fertilisers. Nevertheless, the statement by PBT's Chief Operating Officer (COO) in the meeting shows him as an alert entrepreneur with capabilities to be ready for opportunities. This is demonstrated by his action of inviting Haji Yusof to work for his business. Haji Yusof was a scientist for one of the biggest plantation holding companies in Malaysia, FELDA Bhd. By having Haji Yusof as Head of Research and Development (R&D) at PBT, this family-run business gains better leverage, riding on Haji Yusof's vast technical knowledge and experience in FELDA.

Haji Yusop is actually from FELDA. We also *steal* people from FELDA. [Laughs]. To get the cable (meaning, the appropriate network to facilitate the business process) you know. We have other people outside. This is our scientist. This is also our scientist from the government. Two scientists that are required by the government.

Personal Observation Transcription. PBT. 6 October 2010, p.15

8.3.2 Shaping Information through Interpretation

The interpretation of the above transcription further supports the idea that suggests that an individual's experience is accumulated into a stock of knowledge that can be used to interpret incoming information in a way that differs from the perceptions of the general public. In addition, Baron (2006a) pointed out that knowledge of a particular market, industry or customer is the raw material through which pattern cognition is constructed. More specifically, prior knowledge (as in the case of Haji Yusof, PBT's scientist) helps entrepreneurs (PBT owners) build an idiosyncratic cognitive structure and employ a more complex schema, which is characterised by extensive cross-links to other schema (Ardichvili et al., 2003; Gaglio & Katz, 2001). Gaglio and Katz (2001) propose that alertness schemas play an important role in opportunity recognition. These authors suggest that entrepreneurs, and especially successful entrepreneurs, may possess a schema that they term as entrepreneurial alertness. This is a cognitive framework that assists such persons in being alert to opportunities (Ozgen & Baron, 2007). Gaglio and Katz (2001) hypothesise that persons who possess such a schema show a tendency to search for and notice change and market disequilibria, to respond to information that does not match their current schemas, and to adjust existing schemas on the basis of such non-matching information. This is evidenced in the case of PBT, where the personally funded entrepreneur was able to search for and notice changes that led him to spot potential opportunities in several huge government-linked companies, upon successfully establishing a business relationship with one of the biggest plantation companies in Malaysia, FELCRA. Hence, the respondent spots these opportunities after establishing the business relationship with FELCRA.

I am sure it is because it is a FELCRA [government-linked company involved in the plantation business] company that it is well known and well trusted by the public. When FELCRA can use it, of course, the surrounding people will think that this product can really be used and trusted. Ha, when we get one of these, perhaps we would go to – what's that – Tabung Haji (a government-linked company involved in the plantation business). So, it is based on trust from the first [party] just now, from FELCRA.

In-depth Interview. BRB. 6 October 2010, pp.34–35

The story of BRB shows that schema is a well-established principle of cognitive science, and that information that is organised is often more useful than information that is not (Ozgen & Baron 2007). Hence, the case of BRB reflects that the better developed the entrepreneurs' schemas for knowledge in a given area (such as biotechnology); the more effectively they will employ this information to identify new business opportunities. In addition, persons possessing well-developed alertness schemas seek to be objectively accurate and possess more complex information concerning the nature of change, the nature of specific industries, and specific social environments (Ozgen & Baron, 2007). Hence, well-developed schemas may require individuals to have skills such as observation and research skills in order to gauge and to assess the complex nature of change, the nature of the biotechnology industry, and specific social environments. Retrospectively, in entrepreneurship, to learn what an entrepreneur thinks, they look back over what they have said and done earlier.

My PhD was on external string filter. The unit External String Filter already being used in the industry and it was my design. It was perfected in the Sartorius Lab. One of the projects that we are working on is stem cell bioreactor. We are creating a prototype but we hope in the future all hospitals will have this unit.

Interview. INB. 11 February 2010, p.18-19

From the age of 50 to 55, I did marketing for my product in the village. [I did it] in the village so that I would receive feedback. So, my intention [was] to go big, go global, which at that time seemed impossible. This is because the test market in the village is slow. After five years, both of my partners came to see me and said why don't we set up [a] factory and do large-scale sales. From there this Basal 2000 (fertiliser product brand) was born, to get in to the market on a large scale. So right there, originating from a department, in terms of business mindedness, in terms of marketing, I am a bit lacking indeed. Five years later, after I opened up the Farming Clinic, bit-by-bit I grasped the idea of how to market the product inside the village.

In-depth Interview. BRB. 6 October 2010, p.3

In both cases of INB and BRB, similar patterns emerged from the interview where entrepreneurs shape their decision on current business activities with their past knowledge and experience. In INB case, the respondent refined his idea from his PhD thesis, up scaling the next level into stem cell bioreactor using his INB lab facilities. Perfecting his PhD idea, the respondent sense that the idea is workable to be transformed into a prototype product while demonstrates an act of entrepreneurial thinking. Furthermore, the ambition to see that

all hospitals will have "this unit" influenced his decision to drive his entrepreneurial action forward to achieve his business's goals and ambitions. As retrospective entrepreneurship is driven by what entrepreneur thinks, in the case of BRB, the respondent reflects what they have done earlier to decide and make sense of what strategy(s) should be done. Unworkable idea such as unsuccessful marketing of fertiliser products to the villages influenced BRB respondent to venture into large-scale sales. This was not done unintentionally but was an idea gained from his partner after five years of managing unworkable sales strategy in the village. Gaining fresh business perspective from his partner addresses the issue of liability of smallness and newness thus allowing BRB respondent to view the strategy from a different perspective. However, the challenge of entrepreneurs dominantly relying on past information is the information might be obsolete and irrelevant to the current contexts. In the extreme case, relying on past experience and partner's opinions can hinder entrepreneur's ability to respond creatively towards any new business ventures. Retrospective ideas shape the identity and direction of entrepreneurs. Being long in agricultural activities, BRB develops and locates its business and products within that area of focus. However, retrospective information is relevant for entrepreneurs to assess and evaluate current and future decisions to create new business ventures.

8.4 Extracted Cues

In applying sensemaking to the analysis of this study it is essential to look not at the act of deciding itself but the circumstance or context that resulted in that action. Understanding the contextual circumstances leads one to asking "how" the situation came to be rather than "why" a decision was made (Weick et al., 2005). The entrepreneurship context not only provides the cues, it contains the patterns of cue usage. The entrepreneurial firm's culture may emphasize certain sources for cues and ignore others. Weick (1995) suggest that sensemaking is about the enlargement of small cues and is a search for contexts within which small details fit together to make sense. Entrepreneurs' unique knowledge structures make them especially alert to certain opportunities (Gaglio & Katz, 2001). Ozgen and Baron (2007) take the view that individuals acquire useful information from various social sources - other people with whom they interact - and that such information does, indeed, enhance both schemas (one important type of knowledge structure) and opportunity discovery.

Nevertheless, individuals acquire such useful and valuable information from various social sources including through market trends and patterns, informal and personal trade leads, and individual personal observation, yet providing valuable cues in which small details fit together to make sense of the events or actions. This is true in relation to the stories of the

three different cases of the family, personally and government funded entrepreneurs from INB and PBT, who secure cues emerging from social changes and the environmental problems. These issues or problems are easily identified by majority of the people yet only few opportunity sensed-minded people spot and transformed these into business opportunities. Nevertheless, the process of transformation of the issues-problems, in the case of PBT was driven by biotechnology. Hence, mastering and refining the knowledge transfer of microorganism propagation technology is the key to accelerate the process of opportunity creation in this context. Yet the knowledge transfer and useful information represent the small cues that stimulate business opportunities. Presenting the patterns of cues from the business environment, a comparative element is identified in the family, government funded and personal funded. The examples are summarised in Table 8.2 as follows;

Table 8.2 Table of Cases Comparison on Pattern of Cues

	Patterns of Cues	Notion of Cues	Outcomes
<u>Government Funded (INB)</u>	Social Change	At least in our case, in our work, we're focusing ourselves. Of course, the drugs are a focus. The main focus was cancer. And some other areas like diabetes, and also related to diseases of the immune system. So currently I think cancer is the number one killer in Malaysia. So we are focusing our attention on how to produce drugs that will be able basically to improve the quality of life of the patient or cure the cancer.	Opportunity in health care sector
<u>Family Funded (PBT)</u>	Environmental Issues	Raise microorganisms for variety of industries. In the industry of poultry farming, we don't raise the chickens but we get rid of their bad smells only. This ammonia is the one that's disrupting the poultry farming. It causes deaths, brings bad smells to villages.	Opportunity in green business/technology
<u>Public Funded (BRB)</u>	Market Trends	In terms of what people say, competition, advancement of fertiliser, there are many companies that sell foliar fertilisers. But this 3-in-1, I haven't yet heard about it being made by other companies like ours, the 3-in-1. If there are, we've already checked on the Internet and we didn't find it. So, we can say that it is our company that makes the 3-in-1 products.	Market driven opportunity

	Market Feedbacks	Sometimes, [we] would like to know the quality of our product; we'd ask our users. Sometimes they'd comment. So, right there, we could improve our product. So, we look for ideas on how to increase the yield.	
	Trade Leads	"Mostly those friends are the ex-Agriculture Department people. They know that I have a fertiliser business. So, they know about the product and they themselves use it. So, it went from there. So they said that they read the advertisement, and asked, "Did you apply to tender at the Agriculture Department?" Voluntarily they told me. I know—about opportunities in the Agriculture Department. One of my friends said, "Did you join the tender?" He saw it in the newspaper. From this friend I got the contact. So from there I got the tender."	

The story in the BRB case was about accumulating and connecting logical small pieces of cues from social sources about customer feedback on the products, current demands, and trends driven from the environments. On the other hand, individuals acquire useful information from other sources or people with whom they interact, thus suggesting that friends, colleagues, and emerging health issues alternatively provide valuable cues to opportunities. The analysis on cues above demonstrates that entrepreneurial firms tell the sensemaker (researcher) where to look for cues. The context itself helps one determine where people are directing the focus of their intention, where the cues are coming from. Furthermore, sensemaking in entrepreneurship is about building the cues into full-blown and accepted stories of business opportunities. Yet, this supports the notion of the idea that promotes changes within an existing situation by discovering profitable discrepancies, gaps and mismatches (Cheah, 1990). In biotechnology context, the gap was presented in the form of small cues accumulated from several sources, such as trends and patterns. In addition, biotechnology activities depend largely on technology and yet technology changes fast; where it changes within an existing situation in the industry that translates into profitable gaps in biotechnology trends. Both individual preferences (adding emphasis on biotech entrepreneurs) for certain cues and environmental conditions (such as new diseases, high cost of drugs, high project cost) that make certain cues figural and salient affect one's sense of what is happening (Weick, 2001). The analysis demonstrates that accumulative cues can form patterns and trends that shape entrepreneur's behaviour towards recognizing and

creating business opportunities. Furthermore, cues from emerging issues provide additional sources of information in which useful for entrepreneurs to frame the stimuli into potential solutions to the existing problems. Problems can be translated into possible products/services/ideas that can be transformed into profitable business activities. This involves accumulation and processing of useful information. Shane (2000) posits that potential entrepreneurs should discover opportunities in what they know rather than what is popular with other entrepreneurs. What entrepreneurs know is influenced from what they read and perceived from the cues in the environment. This is evidenced in the government and family funded cases, namely INB and PBT respectively.

Firstly, we have to read a lot. We have to perceive and we have to know what the market demand is, you know. And then, we know the trend of the industry. For example, nowadays people are moving into humanised drugs, antibody immunisation. So before this, the antibody was purely made out of reducing something to carbon, they call it carbonisation. So we humanise it in order to reduce the effect on humans. We stroll around, you know. We see which companies offer this kind of service, and then we say that we want to have some licensing agreement with them. To license what they are doing, meaning that once we have a licence, we can offer this to other companies as well. There are some but not many companies in the world that offer humanisation. The most current trend now is people go direct to humanisation. Meaning we humanise the antibody, now it's fully human, so we have to follow the trend. In fact, one of the products that we can produce is actually EPO, (erythropoietin). So, our country has bought millions of Malaysian Ringgit (RM) of EPOs and this is used for people with renal failure. The government has spent lots of money, so we can tap into this market as well.

In-depth Interview. INB. 23 Sept 2010, pp.15–17

In sensemaking, Weick (2001) claims that it is about the resourcefulness with which people elaborate tiny indicators into full-blown stories, typically in ways that selectively shore up an initial hunch. Technology can be part of the tiny indicators when biotechnology activities are thought to be very reliant on technological advancements. The individual's ability to create opportunities depends largely on how effectively they scan the environment intensively and fluently in order to recognise business opportunities. This is demonstrated in a unique business matching system called the funnelling system that involves the respondent at INB. The system promotes a way of accumulating small cues from the knowledge network and information about potential business leads for INB. The unique information structure that was embedded in the funnelling system described below enables the respondent to be more alert to certain opportunities in biotechnology compared to other individuals who have yet to access this system.

We look for customers, for example, wanting to participate in the one-to-one, business matching, funnelling system. We go from conference to conference. But before we go to conference, of course we have gone onto their website in which there is what we call a matching system. Before we go there, we have to key in all the data, for information about our company. And then, we post what the things are that we are looking for and from there

we can do some searches. Other companies, which also participate in the web matching system, will look for the kind of companies they are looking for. Then before the meeting, for example, let's say I request one customer, Pfizer. So I just click Pfizer, and then I request a meeting and I also mention that these are our capabilities and that we are looking forward, towards potential business with them. This is sent to them automatically by the system.

In-depth Interview. INB. 23 Sept 2010, pp.3

In the case of INB, information is that which shape the respondent's mental representations. Daft and Lengel (1986: 559) define information richness as "...the ability of information to change understanding within a time interval." Communication transactions that can overcome different frames of reference or clarify ambiguous issues to change understanding in a timely manner are considered rich. Rich media, such as one-to-one business matching discussion, enable people to interpret data and make sense of ambiguous information such as rich-information. Whereas information reduces uncertainty, rich information helps make sense of ambiguous situations (Vaghely & Julien, 2010). Continuous and on-going discussions could clarify ambiguous situations between newly known individuals and thus bridging the relationship while reducing uncertainty among entrepreneurs. Here, the challenge of entrepreneurs is to manage the amount of information gathered from the cues. Additionally, is to identify and to frame the complex and interconnected information and cues into activities that could generate business opportunities. Information has a greater impact if it can be embedded into existing, heavily organized, and interconnected knowledge structures (Keisler and Sproull, 1982). Because of the individual's limited information processing capacity, attention demanding information (i.e. salient information) will only be incorporated into organized knowledge structures and long-term memory if it seems relevant to those structures (Vaghely & Julien, 2010). Discrepant information, on the other hand, will tend to be discounted and forgotten (p.75).

8.5 Plausibility Rather than Accuracy

When looking at the sensemaking process from extracted clues, one must remember that sensemaking is driven by plausibility rather than accuracy (Bansler & Havn, 2006, p. 61). Sensemaking demonstrates socially acceptable and credible line of stories and narratives. But in an equivocal, post-modern world, infused with the politics of interpretation and conflicting interests and inhabited by people with multiple shifting identities, an obsession with accuracy seems fruitless, and not of much practical help either (Weick, 1995, p. 61). While sensemaking, people read into things the meanings they wish to see; they vest objects, utterances, actions and so forth with subjective meaning that helps make their world intelligible to themselves (Frost & Morgan, 1983). When people are sensemaking, they are not aiming for accuracy but rather plausibility and sense. If it seems plausible and is

adequate to provide the necessary meaning to take the next step, that is accurate enough for the person to react. Whether that is the “correct reaction” to be made on the specific time is a separate issue. This was seen in the case of Mann Gulch fire (Weick, 2003). One plan of escape made sense to most of the fire fighters. Notwithstanding the plan for escape made sense to them, it was unsound and led to their deaths. The realistic plan did not make sense. This is a key example of individuals acting on sensibility, what makes sense, instead of accuracy (Weick, 1993). In analysing the cases of biotech entrepreneurs, sensemaking is about coherence, how events hang together, certainty that is sufficient for present purposes, and credibility (Weick, 2001) hence it is about making people believe in what you say by producing socially accepted good or convincing business ideas. The respondent INB explains:

So, in terms of society, diseases they come always come. But to us its opportunity for us because we can you knows, we can help whatever people discover, from the university. And then, they can come to us how to further develop, how to make a proof of concept, how to do the research grade material. And then do some, animal study and then they get proof of concept and then they can go into clinical trial. In terms of society for example, all of these need money, hence to raise the fund and awareness to the people of cancer for example. I think that we indirectly, reflect what we are doing.

Case INB (GF). In-Depth Interview. 23 September 2010, p.20-21

Analysing INB case, the respondent, connects the idea of opportunity with the effect of the current issues in the society, the cancer disease. He built a credible line of stories, reflecting how his company together with other research and educational institutions could benefits on the effects of increased in cancer disease. While, with the mobilisation of resources and technology, INB shapes the ability to offer biotech solutions to capture the vast potential business opportunities in the health care sectors. Sensemaking is also a social activity in that plausible stories are preserved, retained or shared (Isabella, 1990; Maitlis, 2005). However, is the story of Dr. Nazrul and his company accurate or merely plausible? It is a selective rather than complete account of the business, which may be convincing, but equally, Dr. Nazrul's narrative may omit mistakes, what went wrong, and apparently the reader could construct alternatively different interpretations of the case. Hence, the above stories presented the challenges on the concept of belief. Can I trust and belief the story? Does the story make sense to me as the sensemaker? Belief is the psychological state in which an individual holds a proposition or premise to be true (Schwitzgebel, 2006), appearing true, reasonable, or fair, and trustworthy. In trust, fulfilling one's obligations is a demonstration of benevolence, not a plan to obtain tangible benefit (Nguyen & Rose, 2009). For trust to grow and be sustained, the partners or collaborators need actively to learn about and demonstrate to each other benevolence, integrity, and ability. Partners could also work together to solve problems and to develop each other's capability (Hagen & Choe, 1998).

Thus, entrepreneurship must demonstrate trust and emotional appeal in producing socially acceptable good business stories. This is demonstrated in the case of INB, in the story of trust:

Trust is very important. If the person trusts you, you'd be in the job. People like Dr. Joachim – he used to work for Boehringer Ingelheim (an international company dealing with pharmaceutical and biotech products) and in fact, he helped us. This coming March, his ex-boss, who is now in BioGen Idec. (An international company dealing with biotech products) is coming to visit us. He's talking positively about us. So his ex-boss decided to come over and have a look at our facility and we hope to build a relationship and get business from Biogen Idec.

Case INB (GF). Personal Interview. 11 February 2010, p.9

Nguyen and Rose (2009) suggest that trust can be developed through personal rapport with representatives of the partners, establishing a system of personal relationships between firms. This is true in the case of INB, where a former member of staff of one of the biggest pharmaceutical companies in Germany, Boehringer Ingelheim, was invited to interact closely with INB. Trust ensures that the parties involved in an exchange relationship behave in a predictable manner and do not shun their responsibilities, and such behaviour is important to smooth the exchange of goods and services; this in turn is mostly initiated based on promises rather than legal contracts (Bhagavatula et al., 2010). It provides the means to decrease complexity in a complex world by reducing the number of options one has to consider in a given situation (Luhmann, 1979; Barber, 1983; Lewis and Weigert, 1985). Trust can also be viewed as a kind of social capital that makes coordination and cooperation between people possible (Putnam, 1995; Misztal, 1996). In the world of business, trust is key to successful transactions and long-term relationships (Koehn, 1996). It has even been proposed as an alternative form of control in place of price and authority (Creed and Miles, 1996).

Additionally, as plausibility is about coherence and holds a proposition or premise to be true, reasonable and fair, one may narrate a story that is emotionally appealing to the audience to build credibility and authority. PBT respondent explains, “ *If we want something to do with society, we want to serve the citizens, the people. I mean, giving a good product, giving a good product to them. I think that for us, people living in society, there are many problems. Bad smells cause a lot of problems, dirty water causes a lot of problems, and trees that are not yielding also cause a lot of problems*”. Similar pattern of plausible decision rather than accuracy presented by BRB respondent;

When I quit my [government] job, there was no pension. There was none. I was then aged 30 something, not yet in my 40s. I gave a notice [but] I had to pay one-month salary because I wanted to quit quick as I wanted to grab this one business opportunity. You'd have to be 40

[when you quit]. If you were 40 then you'd be entitled to a pension. But since at that time [quitting] I wasn't 40, I was about 37 years old then – that was 13-14 years ago. I left because I had a business opportunity at my doorstep.

In-depth Interview. BRB. 6 October 2010, p.7

The case of BRB reflects the more plausible risk taking action rather than accuracy in making future decision. He trusted his decision in securing and creating business opportunity at that particular moment rather than the action to remain and working for government's institution. The decision for him to relinquish the rewards of pension to one extend demonstrates that it makes sense to home to venture into new activities despite the limited information on the business itself. Presenting the patterns on dimensions of plausibility over accuracy in entrepreneurship context, a comparative element is identified. The examples are summarised in Table 8.3 as follows;

Table 8.3 Table of Cases Comparison on Dimensions of Plausibility over Accuracy

	Elements of Plausible Decisions	Summary of Belief
<u>Government Funded (INB)</u>	Capitalising societal issues	Entrepreneurship is a way of shaping social problems/issues into opportunities
<u>Family Funded (PBT)</u>	Addressing environmental effects	Entrepreneurship is a way to fully integrate individual's ability to mobilise resources (i.e. technology) into business venture
<u>Public Funded (BRB)</u>	Risk taking	Entrepreneurship is a process of risk taking into identifying potential opportunity

In short, the explanation of the sensemaking process must “make sense” not necessarily “be accurate.” Accuracy is less important to plausibility for several reasons. First, individual is constantly refining the cues that affect their decision-making process. Next, individual tend to connect present cues with previous cues and build present sense on sense made in the past. Finally, accuracy is more relevant for short durations and for specific questions than for global circumstances (Weick, 1995).

8.6 Enacting Opportunity

Sensemaking is a combination of “action and cognition together” (Weick, 1995). Weick refers to this as “enactment.” This presents that individuals engage in their environment. As they are enacting their environment, they are also making sense of it. People are making sense of dynamic environments “not some kind of monolithic, singular, fixed environment that exists detached from and external to those people” (Weick, 1995, p. 31). The individuals or biotech entrepreneurs are part of the environment through the process of co-constructing it

with sensemaker (the researcher). Enactment demonstrates two concerns: What's the story? Now what? When people act in order to answer these concerns, they are acting typically to determine the answer (Weick, 2003). The sensemaker (the researcher) enacts the environment, and the environment enacts the sensemaker (the researcher). Creating of sensible environments in entrepreneurial applications means recognising opportunities and innovating new products, services, ways of working and organisations within existing environments, which will have an impact on those environments (Rae, 2007).

From the conceptual framework, enacting opportunity means discovering and creating opportunities by individuals; hence, institutional support and social forces of the environments affect it. While biotech entrepreneurs enact opportunities using several resources of personal and formal networks to gain access to valuable key information and decisions, there are also environmental factors affecting this process. These are not limited to institutional support and social and cultural forces influencing why and how entrepreneurs create sensible meaning in recognising opportunities in the biotechnology industry in Malaysia. Sensible meanings tend to be those where there is social support (Weick, 2001), including, this thesis argues, the government's support through regulatory policies, and financial support through grants and loans. Hence, biotech entrepreneurs narrate plots of stories or events that signify the creationist view of opportunity. For example, the story demonstrated in the case of INB reflects the inter-relationship of creation opportunity in the form of personal networks and institutional help through technology or patents from the university. This relationship of entrepreneur–institution supports the process creation of biotechnology opportunities.

Promotion – two main things, on how do you get us. Number 1 – we also participate in the exhibition Bio Malaysia (a yearly event of the biotechnology international exposition held in Malaysia). We also participate in the biomolecular society when they have an annual meeting. We participate in that. They also have an exhibition. Some of our colleagues, also our Vice President (VP), for example, Dr. Zul, come from the university so they also have friends at the university, not only from the same university, but other universities as well. So this forms the network. From MARDI we also have two potential projects. From IIUM (International Islamic University, Malaysia) there's one potential project. That's all I can say. And then from IIUM, also a very interesting project: they want to come up with a diagnostic kit with which you can check whether the chicken is slaughtered or maybe just stunned. You can identify that through the kits.

In-depth Interview. INB. 23 September 2012, pp.35–36

The process of opportunity creation in the cases of biotech entrepreneurs at least were never a singular approach in which one entrepreneurs follows the same model thus allows him or her to spot and identify business opportunities. Opportunity creation is the interplay of different and selective variables, for example entrepreneur's participation in international

exposition and network building process. The networks gathered during such activities might not be useful now and then yet brings valuable key information's and contacts that could facilitate entrepreneur's future business venture. Rae (2007) argues that social and community networks and connections provide many experienced entrepreneurs with subsequent business opportunities. The analogy of network is about creating a common understanding on sharing and access to business resources using multiple lanes of a shared motorway heading towards the same final destination, which are profit opportunities. Business networks for opportunities require the action of enactment. The action of enactment, said Weick (2001), means probing something to see how it reacts. Notwithstanding, networks, be they personal, social or media, are commonly utilised to facilitate business ventures. Below are the beliefs on the importance of the role of networks in comparison to three different patterns of government's funded, personally funded and family funded biotech entrepreneurs':

Government Funded Case 1: INB

Networking is very important. People don't give you business because you have a facility. People give you business because they know you. The network is definitely a very important tool for us.

Case INB. Personal Interview. 11 February 2010, p.9

I have joined because I have Linked In (business network group forum, web based). Probably that is the business network. Facebook is a social network, but this is Linked In. So I joined Linked In. I joined a few – I think about 10 – not to say a business club but I would say a group. I belong to certain groups. Of course before you join the group, you have to apply for that business network.

In-depth Interview. INB. 23 September 2010, pp.24–25

Personally Funded Case 2: BRB

I need to have the network because as we are now, we have agents. The main agents that we've set, the main agents will create a website for their own network in order to market the products. That's it. So, to create the network, for me there are many ways. We may use the mass media and a variety of the approaches that we have to have.

In-depth Interview. BRB. 6 October 2010, p.23

Sometimes in my free time, I'd call my friends, in Terengganu or wherever, to ask them how they are and sometimes through doing that I'd get opportunities.

In-depth Interview. BRB. 6 October 2010, p.61

Family Funded Case 3: PBT

We use word of mouth. We don't have to play golf, don't have to do that. Like I said just now, if our product is good, everybody comes over. When we organise an exhibition, people from overseas come over.

Case PBT (FF). Personal Interview. 11 February 2010, pp.44 & 48

In all three cases, it is evidenced that network remains as one valuable facilitator to business success. At least in the case of INB business network is effectively functional in the event of entrepreneur's familiarity of the network structures and are able to spot and create possible events or activities favourable to their business objectives. Consequently, all three cases of INB, BRB and PBT support Birley's (1985) study, which found that informal ties (i.e. family and friends) appear to play a more significant role than formal ties (i.e. banks, accountants, etc.) when it comes to making resources available. Informal networks such as social media were adopted to provide reach and access to the networks' coverage, hence agreeing with Birley's (1985) and Aldrich and Zimmer's (1986) ideas, that entrepreneurship is "embedded in networks of continuing social relations". Furthermore, within complex networks of relationships of biotech entrepreneurs, entrepreneurship is facilitated or constrained by links between aspiring entrepreneurs, resources and opportunities. The analysis in this chapter suggests that the personally funded case of BRB and the family funded case of PBT appear to be relatively more successful in securing resources for their firms using informal ties (i.e. family and friends) while the government funded case of INB appears to find a more significant role in formal ties (i.e. banks, government agencies, etc.) when it comes to making resources available. Social networks also facilitate entrepreneurs in creating trust between actors, because trust allows the members to learn about each other through repeated interactions and to cope with the liability of newness to expand their business ventures. The results of the present study are consistent with the view that socially provided information can indeed be helpful to entrepreneurs from the perspective of identifying opportunities for new ventures (Ozgen & Baron, 2007). Consistent with the findings of previous research (e.g., Kaish & Gilad, 1991; Singh et al., 1999), informal industry networks shapes the entrepreneurs' alertness to new opportunities.

8.7 Sensemaking in the Sociocultural/Institutional Context

Sensemaking is an on-going process and never starts. The reason it never starts is that pure duration never stops (Weick, 2006, p. 43). The sensemaker (the researcher in the case of this thesis) can only live in the here and the now. One is always in the process of making sense. "Sensemaking is clearly about an activity or a process..." and not just an outcome (Weick, 1995, p. 13). As individual entrepreneur are making sense, there are always new stimuli that influence the process and the sense. To sense something sounds like an act of discovery. Besides to sense something, there must be something there to enact the sensation. And sensemaking suggest the construction of that which then becomes sensible" (Weick, 1995, p. 14). Problems are "constructed from the materials of problematic situation which are puzzling, troubling, and uncertain" (Weick, 1995, p. 9). For the sensemaker to

resolve the complex or problematic situation, he will look for clues in the environmental context as part of the sensemaking process. Analysing the three cases, the conceptual framework suggests that the clues are influenced by the views of the entrepreneurs about the institutional and social environments affecting their business activities. This is presented in the summary of findings in Table 8.4.

Table 8.4: Socio-Institutional Issues Affecting Business Activities

	Opportunity Driver	Summary of Views	Views on Socio Institutional Issues
<u>Government Funded (INB)</u>	Providing tangible solutions	"I think Malaysian government is a very proactive government. I think our educational program is one of the excellent educational programmes in Asia. We got basically one of the best infrastructures in Asia."	Positive
<u>Family Funded (PBT)</u>	Institutional support	"It's lacking. In terms of the government, they don't give much enforcement. With the enforcement, it would be more lucrative."	Negative
<u>Public Funded (BRB)</u>	Leadership will	"The government (Malaysia) has started to prohibit the use of Paraquat as it was already debated in the parliament. It (Paraquat) has been banned in the parliament, but there hasn't been any enforcement. It is still being sold?"	Negative

Consequently, the absence of laws enforcement hinders the growth of business among biotech entrepreneur. Government's intervention in the forms of policy execution and implementation provides better and avenue for entrepreneurs. The demand of effective policy is second to none to entrepreneurs in developing countries particularly in Malaysia. Previous studies show that effective entrepreneurship policy cannot be one that limits itself to business subsidies or imposes top-down strategies (Minniti, 2008). Minniti reiterates that entrepreneurship that is positively linked to performance does not justify public policy intervention. Hence, the evidence in the summary of findings in Table 8.1, demands effective public policy intervention to reduce the increasing level of unpredictability of business environments that might influence the decision of entrepreneurs to shape business opportunities. Consequently, government and public sector policy advisors, especially those responsible for policy implementation, often appear to inhabit a different world and use a different language from those starting and running small businesses (Rae, 2007). The stories told would suggest that the government funded case of INB appeared to be relatively more inclined towards the notion of institutional support, while the family and personally funded cases of PBT and BRB appear to suggest that the government's regulatory agencies

have not done much to facilitate entrepreneurs. The moderator of entrepreneurial opportunity could also be reflected by theoretical sensemaking and by theorising that the institutional support force is the unpredictable environment affecting entrepreneurial activities to recognise and create opportunities.

Sensemaking is “both an individual and social activity,” and it is unclear whether these are separable because this activity is “a durable tension in the human condition” (Weick, 1995, p. 6). Together, it is an individual and a collective process at the same time. Sensemaking recognizes that “the social context is crucial, because it binds people to actions that they then must justify, it affects the saliency of information, and it provides norms and expectations that constrain explanations” (Weick, 1995, p. 53). In entrepreneurship context, cultural values may play a role in the extent of entrepreneurial activity in a country (Bygrave & Minniti, 2000). In this thesis, the conceptual framework suggests that social aspects influenced the process in which entrepreneurs shape their business activities to create opportunity. Weick (2001) interprets social context as, “*what I say and do is affected by the audience that I anticipate will audit the conclusions I reach*”. Hence, in order to satisfy the audience (in this case, the customers) people create rules, routines, norms, and ways of working which work for them in getting things done effectively. Rules, routines and norms could easily be transferred between one to another through social learning process and thus shapes into an identity of a group. In BRB case for example, the value of time is shaped on the assimilation of different cultural values of the Chinese business practices in Malaysia. Values are learned and adopted through social interactions hence is an on-going process in which entrepreneurs enriched their identity. This is demonstrated in the BRB story below;

But as for us, the easiest thing is socialising, since we also have a budget for entertaining, to have lunch or we go to karaoke. We look at what our client's interest is in terms of socialising. If we see that they are into karaoke, we'd have to go to karaoke. If they are into golf, we tell them the company will take care of it. Yes, they are important. So doing business is like PR. If our PR were not good, our product definitely wouldn't sell much. This is because, if we look at the foreigners doing business, it is always that when you do not buy, they don't get angry with you. They smile. But our people, those who do small business, they get angry if we don't buy their product, right? Ha, this, with their sulky face and all. But look at the Chinese doing business: “I don't want to buy this shirt, it's not nice.” “It's OK, Encik, just look around.” They respond in a good way, right? The Malays, if you say it's expensive, they put on a sour face. That's not a right way to do business, right?

In-depth Interview. BRB. 6 October 2010, pp.25 & 27

Notwithstanding, entrepreneurs also learn from their customers. Customer provides them with a set of behavioural cues and patterns in which entrepreneurs could make sense of it. The needs and wants of customers differ, while adopting and managing these diversities to build closer business relationship means entrepreneurs might need to reform and shape

their strategies accordingly. Nevertheless, entrepreneur's identity and personality are greatly influenced by the diversity of cultural values and norms. Punctuality is normal business value demonstrated by most Chinese businesses in Malaysia hence Malay tend to assimilate such value in their identity. This enriches the existing social norms in business such as the values of humbleness and respect to people associated in the Malay community itself. Nevertheless, the analysis presents other common values shared and practiced by entrepreneur such as one describe in the case of PBT. In this case, the identity influences the ability of entrepreneur to manage emotional and social challenges within the whole process of creating and managing business opportunities.

You are not the owner [you don't have to go through the hardship]. We go out there to earn money for the staff. We go out to learn. We go out, we must make sales. Being an entrepreneur- if you become an entrepreneur, you wouldn't sleep at night; always planning on how to make money, monthly salaries [for employees].

Case PBT (FF). Personal Interview. 11 February 2010, p.32

Additionally, social learning encourages identity building while developing entrepreneur's identity in spotting and creating business opportunities. Identity's borrowing also present in the form of capturing and learning valuable lessons from past career experience. This is relevant to the case of the government-funded entrepreneur, INB.

I learned a lot from my CEO at that time, Mr. John Lee. He really got me to speed and to understand how to really run a business. In my B. Braun time I was really being helped, coached by the CEO. We need to have a thinking organisation. We cannot be a 'yes man' organisation. A thinking organisation – people need to think and contribute to the thinking process and also change the mind-set and culture, because our culture never promotes questioning too much; teaching them to express themselves in front of the person. We must practise a democracy where you can express your opinion. You must express your opinion and then as long as you have expressed your opinion, you have done your part.

Case INB (GF). Personal Interview. 11 February 2010, pp.6 & 8

The story of INB case supports Rae's (2007) notion on narrative construction of identity, in which personal and social identity develops over time, shaped by life experiences of change and learning. While entrepreneurship is described as inherently containing a moral imperative (Anderson & Smith, 2007; Carr, 2003), or, at the least, being consonant with ethical conduct (Surie & Ashley, 2008), other work points out that entrepreneurship can actually be societal detrimental. For example, Baumol (1990) points out that opportunistic entrepreneurial rent seeking can encourage corruption and its consequences. However, the analysis for this thesis is not addressing entrepreneurial rent; rather it is examining how the social context of the belief system was integrated in the whole process of opportunity discovery and creation. This is ideally connected to what was said by the respondent of PBT in his story that creation of profit opportunity is not solely about wealth but is that they "*want*

something to do with the society; we want to serve the citizens, the people." While, this statement may suggest that entrepreneurs are not solely into opportunity seeking and creation. The aim of opportunity creation is driven beyond that, while is influenced by the social context of the entrepreneurs and closely attached to one's belief, which Schwitzgebel (2006) defined as the psychological state in which an individual holds a proposition or premise to be true. The thesis's framework conceptualised that belief system that is embedded and practised (such as religion) is a critical element of an individual entrepreneur in their journey of business opportunity creation. In facing this journey, there are massive challenges and obstacles for entrepreneurs in mobilising their limited resources to achieve their aims. Murray (2011) suggests that aligning with the power of our human spirit can help to pull us through the tough times and discover opportunities where others only see obstacles. He further argues that we, as humans, are layered beings and we are physical, cognitive, emotional, psychological, and spiritual by nature. Hence, aligning entrepreneur's with the power of the human spirit together with their belief system enables them to cope with these business challenges.

Research suggests that socio-economic crises result in more people turning towards religion and spirituality (Smith, 2009). Since spiritual enterprises often promise a reward that is both permanent and transcendent, it could alleviate anxieties caused by crises and upheavals (Shinde & Shinde, 2011). In discussing the construct of spiritual aspects linking to entrepreneurship activities, I would like to suggest that this was a theme emerged from the research and was not expected. The theme of spiritual sustenance is presented in the social context of entrepreneurship discussion. The discussion demonstrates that the unique systems of meaning, action, or beliefs emerging from the data analysed in this thesis are deeply rooted in the Islamic concept of *tasawwur* (conception), which promotes the idea of spiritual sustenance. Islamic *tasawwur* identifies entrepreneurship as one of the best forms of livelihood or occupation (Abdul Hamid & Sa'ari, 2011). Furthermore, Abdul Hamid and Sa'ari argue that even though Islam allows its followers to be employed by others, earning fixed salaries, it calls the followers to be more involved in entrepreneurial development. Al-Quran manifests this encouragement towards Muslims clearly through a summons like "*seek, using all resources available on earth and open up opportunities for the same cause*"⁴¹. The importance towards entrepreneurship activities are demonstrated in all statements of BRB, INB and PBT respondents, where all agree that Islam encourages its followers to engage in business activities. Yusuf al-Qaradawi (2001) mentions that the philosophy of Islamic entrepreneurship (adding the emphasis of spiritual sustenance) is

⁴¹ Refer to surah al-Ja'siah (45): 12-13, al-Hijr (15): 19-22, al-An'am (6): 141, al-Najm (53): 39, al-Nur (24): 37, al-Jumu'ah (62): 9 dan al-Tawbah (9): 24.

governed on economic philosophy itself, where trades are based on *Rabbani* (*divine*) and divinity traits. Al-Quran itself emphasises the spirit and principles of freedom, justice, and morality in every form of entrepreneurial activity. The principles, conditions, and rules that have been set aim to ensure the survival of the business (Ahmad, 1995) and to gain *barakah* (blessings) from Allah the Almighty. This is presented in the case of BRB, below. The respondent defines the meaning of performing business activities as one form of divine activity:

In Islam, work, it is *Ibadah*; because when we work, we would gain the profit until...if we've performed the Hajj, for example, paying the tithe. So when we pay the tithe, we help in terms of the public. The beauty of Islam is that if we work, we gain profit and we can pay the tithe, which will help everyone: helping out those who are poor and needy. That is, if we go to what people call Islam.

In-depth Interview. BRB. 6 October 2010, p.9

The interpretation of BRB case as above was influenced by the respondent's strong religious faith in Islam and thus Islam shapes his views towards opportunity. Opportunity creation for him does not stop once business opportunities are materialised. It is an evolutionary process in which one need to submit to the divine path of following what he subscribes as Islamic practice. Islamic practice requires its followers to adhere to the principle of work or business as *Ibadah*, performing the obligation of Hajj and paying the tithe. Henceforward, the rewards promised for obliging these practices are not physically visible yet only will they be rewarded in the hereafter. This is written in the holy book of Al-Quran: "Worship is done by people of strong faith who are not distracted by business or trade from quoting and remembrance of Allah; establish regular prayers and practice regular charity; they fear the hereafter." (Surah An-Nur: 37). The notion of business as *Ibadah* or worship reflects a guiding principle of the social belief system embedded in the opportunity creation process. The case of BRB explains:

We have to have faith. Our share of wealth is given by Allah (God). We have to remember: when it comes to money/financial issues, we have to have faith in Allah (God); it's *rezeki* (sustenance). Some people are not involved in business and yet they become rich too. Some people do business but it does not work out. So, all these *rezeki* matters come from Allah (God).

Case BRB (PF). Personal Interview. 5 February 2010, pp.13 & 15

For the Muslim entrepreneurs, opportunities are defined as *rezeki* (sustenance), yet sustenance is a responsibility more than a reward. Muslims believe that honest and good deeds will result in *barakah* from Allah in their lives. This will result in ease in daily routines, a happy life and a lot of blessings in this life and the hereafter. *Barakah* or blessing is one important component that constitutes the notion of spiritual sustenance. *Barakah* is the

Arabic word which means blessing; in particular, it is a spiritual gift or for protection from God Almighty, Allah. In Christian religion there is a word *berakhah*, which means charisma or excellence award from the Lord. Incidentally, the word *Baraka* used in the French language is synonymous with the word luck (fate). An individual who receives *Baraka* is said to have the ability to avoid dangerous situations in his or her life. In the process of recognising and creating opportunities through entrepreneurial activities, Muslim entrepreneurs are influenced by the principle of *barakah*. Hence, *barakah* promotes the feeling or a sense of self-efficacy, a belief in dealing with trade and commercial transactions. This is manifested in the case of INB, in facing hard times and challenges:

So challenges need to be overcome; so you feel good when you have a good thinking process and you develop that and you solve the problem. That should be inside you. I was reading the Quran this morning and Allah says that you must be strong, you should not have a weak heart and you should not always feel down. You must have always the feeling that Allah is there watching you and you pray to Him and He will get you to better a place. So, that's the meaning of the verse. I was reading out Ali Imran (one of the verses in the book of Holy Quran) today. So, actually, we have the greatest gift from Allah, to be a Muslim. We carefully read those Quranic verses and as a Muslim we are very strong. Because Allah says in the Quran, we as Muslims should not have any inferiority that means a feeling of weakness. So, obviously we also pray that God will give us only things that we can handle, right? So, so far, God, Alhamdulillah (thanks to Allah) has given me challenges that I can carry.

Case INB (GF). Personal Interview. 11 February 2010, pp.12–14

From the stories told, it would suggest that all the cases – BRB, PBT and INB – demonstrate that opportunity enactments, affected by social context in the forms of systems of meaning, action, or beliefs, appear to play a more significant role when it comes to making resources available. In the case of biotech entrepreneurs, it is theorised that profit opportunity creation is essential for spiritual sustenance and it is guided by the principle of *barakah*. This is explained in the book of the Holy Quran where the word *barakah* is among the blessings that Allah says in Surah Al-A'raf verse 96, which means, "If the State of the people believe and fear surely we will bestow on them blessings from heaven and the earth." However, Goody (2003) argues that religion as being more of an impediment to rather than an instrument for development and progress. Goody posited that religion limits individuals' ability to think freely and restricts the scope of their inquiry. "It is possible that the very absence of a world religion, with the various restrictions that implies, was in part responsible for the enormous expansion of intellectual horizons in Greek thought" (p.67). Hence, is Goody's argument substantive or merely imposing what he considered as the accepted values that other should embrace? Pfaff (2002) questioned what makes the West believe that they are in a position to decide not only what suits the West, but also establish that Islamic values (read Islamic business values) are "unsuitable for the Muslim themselves". He concluded, "in short, they

are to become us". Yet, will entrepreneurs subscribing to the context of spiritual sustenance willing to surrender their moral (read spiritual) identity"? The challenge is whether these entrepreneurs do really want to become "us".

The power and material dynamism of the West were seen inseparable from a value system that demands that Muslims give up their moral identity (Pfaff, 2002, p.1). In short, do Muslims or Muslim practising entrepreneurs really need to surrender their moral identity in embracing the values embedded as spiritual sustenance in their daily business activities? All religions require, thus expect, their adherents to act and behave ethically and morally at all times especially when carrying out business activities (Baydoun, et al 1999; Sherman, 1997). Since the goals and rewards of entrepreneurs can often be non-material; such person may not be give up on their ideals, identity and ventures easily. In fact, many of spiritual enterprises are known to have persisted in the face of heavy odds (Shinde & Shinde, 2011). In contrast, since other entrepreneurs are often dependent on tangible rewards for business survival, an absence of such successes may encourage the other entrepreneur give up more easily. Presenting the patterns of cues from the business environment, a comparative element is identified in the family, government funded and personal funded. The examples are summarised in Table 8.5 as follows;

Table 8.5 Table of Cases Comparison on Emerging Themes of Social Contexts

	Opportunity Driver	Summary of Belief	Outcomes
<u>Government Funded (INB)</u>	Social learning	Entrepreneurship through social learning shape entrepreneur's mind-set and culture	Identity building
<u>Family Funded (PBT)</u>	Entrepreneurial value	Entrepreneurship is a way to fully integrate and mobilise limited resources to gain competitive advantage	Resilience
<u>Public Funded (BRB)</u>	Spiritual Sustenance	Entrepreneurship through spiritual values influenced the process of enacting business opportunities.	Spiritual identity

Despite being an emerging theme, spiritual sustenance in entrepreneurship affects all facets of business activities and entrepreneur's behaviours thus re-shaping how entrepreneurial opportunity is framed considering the diversities of cultural values globally.

8.8 Conclusion

Conclusively, there are four main contributions of this chapter. Firstly, the prior knowledge, experience and social learning, shape the personality and identity of entrepreneurs. Newly

refined identity emerges in the event that activities, practices, and values of entrepreneur's social interactions change. Such evolutionary process allows family funded biotech entrepreneurs with limited financial and social capital, to re-combine limited resources effectively. Additionally, in the case of personally funded case, entrepreneurial passion influenced idea generation leading to valuable and sometimes useful cues. Cues or information extracted from sources such as reading, social interactions, and research leads to potential business opportunities. Secondly, entrepreneurs demonstrates the ability to perform different roles of knowledge acquisition through reading, researching, and personal observation to acquire relevant and valuable information extracted from the surrounding environments in making critical decision making and facing uncertain environmental conditions. Entrepreneurs recognise business opportunities by gathering multiple sources of key information which includes prior evidence and experience and interpreting it with critical judgements. Nevertheless, alert entrepreneurs poses internal and external capabilities, i.e. social capital, to be ready for opportunities (Puhakka, 2011), more importantly they are capable of categorising and translating pieces of cues from market feedback, demands and trends and information into a potential ideas leading to business opportunities. The analysis in this thesis suggests that an individual's experience is accumulated into a stock of knowledge that can be used to interpret incoming information in a way that differs from the perceptions of the general public. More specifically, prior knowledge (example of Haji Yusof, PBT's scientist) helps entrepreneurs (PBT owners) build an idiosyncratic cognitive structure and employ a more complex schema, which is characterised by extensive cross-links to other schema (Ardichvili et al., 2003; Gaglio & Katz, 2001). So, entrepreneurs, and especially successful one, possess a schema of entrepreneurial alertness facilitating the process of discovering and creating business opportunities.

Thirdly, the enactment notion of sensemaking contributes to better explanation on entrepreneur's ability to spot and create business opportunities using various personal and formal resources to gain access to valuable key information and decisions. This emerged from entrepreneur's ability to assessing the business environment and thus interprets the valuable information into actions. Opportunity creation is the interplay of different and selective actions. The networks acquired from different events and activities might not be useful immediately, yet may add values that could facilitate entrepreneur's future business venture. The notions of business networks for opportunities require the action of enactment. Weick (2001) argues that enactment as the means probing something to see how it reacts. Notwithstanding, networks, are commonly used to stimulate business ventures. So, to satisfy the customers, entrepreneurs create rules, routines, norms, and ways of working which work

for them in getting things done effectively. The social notion of sensemaking views that, rules, routines and norms could easily be assimilated between one to another.

Notwithstanding, entrepreneurs also learn from their customers. Customer provides them with a set of behavioural cues and patterns in which entrepreneurs could analyse and interpret it. Nevertheless, entrepreneur's identity and personality are greatly shaped by the diversity of values. Social learning process motivates identity borrowing hence enriching entrepreneur's identity in opportunity enactment process. The theoretical framework, helps examined the social context of entrepreneurs' belief systems. While being an emerging theme in the thesis, the entrepreneurial opportunity creation framework enriches the view that socio-cultural values such as religious beliefs guide and influence entrepreneur's action and decision to recognize and create business opportunities. To reiterate, this thesis is about how and why entrepreneurs discover/create opportunities. This means that the study demonstrates how entrepreneurs relate to and enact their identity, cultural values and religion. Hence, reflecting at the earlier arguments and analysis of different literatures, this study posits that opportunity is being created within specific norms and situational set-up of each individual entrepreneur's prior knowledge and experience. This indicates the complexness of the process in which individual entrepreneurs discover/create opportunities.

Chapter Nine

Conclusion

9.0 Introduction

The study set out to explore the concept of entrepreneurial opportunity creation in the context of biotechnology industry in Malaysia. The thesis builds upon comprehensive discussions of the debate on the nature of entrepreneurship and in particular, the nature and genesis of entrepreneurial opportunities. This has involved examining the different perspectives on entrepreneurial opportunity and their arguments, including causes of entrepreneurial opportunities, debates on whether opportunity is discovered or created. In addition, the study has applied sensemaking theory to address the main research questions on how entrepreneurs recognize and create business opportunities with the influence of the individual, institutional supports and sociocultural forces. The study sought to answer the question: How do entrepreneurs discover and create opportunities in the context of biotechnology industry in Malaysia?

9.1 Empirical Findings

The main empirical findings are summarized within the empirical Chapters 5, 6, 7 and 8. Chapter Nine in order to answer the study's main research question. How do entrepreneurs discover and create opportunities in the context of biotechnology industry in Malaysia. This study's primary focus is entrepreneurial opportunity discovery and creation processes: the interpretation and shared meanings that develop in managing and maintaining appropriate behavioural actions in interactions. This draws on Weick's (1995, 2001) conceptualization of the sensemaking properties of identity construction, extracted cues, retrospection, plausibility, enactment of sensible environments, on-going activities, and social context. Through the narratives of spoken, written and personal observations, sensemaking is used to investigate the phenomena of opportunity discovery and opportunity creation of biotechnology entrepreneurs in Malaysia. In uncovering the main research question through the sensemaking lens, three dominant forces of individual, institutional and sociocultural factors were investigated.

In answering the main research question, the findings demonstrate that entrepreneurial passion drives entrepreneurs into territories that they perceive as important and valuable. This passion is focused on activities in which people invest time and energy in activities that

they find important (Vallerand et al., 2003). It was evident in the family funded, personally funded and government funded businesses alike that this energy motivates entrepreneurs to be alert and responsive to opportunities that might help them realise their business goals. The owner of Alor Gajah Gardening Products (AGGP) was driven by his passion for planting and selling herbs as a hobby, Mr Rahman of Brass Bakti claimed he was motivated to go into business by his passion and that it continued to drive his activities, while the government funded enterprise of Dr. Farminah was founded on her interest in research and homeopathy. This type of motivation can have a range of positive outcomes including pride (Bierly, Kessler & Christensen, 2000), love (Baum & Locke, 2004; Cardon et al., 2005), and enthusiasm and joy (Smilor, 1997), which occur as part of the entrepreneurial process and provide entrepreneurs with the emotional resources to cope with the inevitable challenges that will face them. This study clearly shows that entrepreneurs demonstrate strong will during the process of opportunity creation, supporting Schumpeter's notion that an entrepreneur needs unusually strong will and personal strength during this process. While, passion is activated by emotionally important goals that control and guide desires, thoughts, plans, and behaviours, and that it persists over time, regardless of cost, external obstacles, and moral objections (Fridja, 2005).

It is clear that prior knowledge and career experience facilitate entrepreneurs to enable unnoticed opportunities to be identified, networks of contacts to be built up and skills developed. Hence, to confer an ability to recognize the value of new information, to learn, and to apply it to new commercial ends (Cohen & Levinthal, 1990). These were demonstrated in the cases of the biotech entrepreneurs, in which the three main elements of knowledge in biotechnology, management and corporate experience, and family experience in business, supply valuable cues and information in the search for and creation of business opportunities. These elements have facilitated entrepreneurs in developing and honing their entrepreneurial skills and knowledge during their work careers, prior to venturing into their own entrepreneurial activities. Furthermore, these driving forces have also 'opened doors' in the creation and discovery of opportunities. The distinct background and character of entrepreneurs led them to establish cultures that are not only rich in core values and performance-enhancing behaviours, but that are also commercial environments conducive to learning and encouraging flexibility (Denison et al., 2004). The clear contribution is to demonstrate how entrepreneurs in this respect are more likely to search for information within a more specific domain of the biotech business context, based on their past experience in terms of routines and information sources that have worked well in the past. However, the novice entrepreneurs (i.e. Dato' ABY (AGGP) and Mr. Hisham (Asma Agro)),

with no prior experience may have access to fewer benchmarks to establish whether the information they have gathered is appropriate to identify and create business opportunities.

Addressing the research question, it can be seen that all biotech entrepreneurs present specific values in the process of enacting profit opportunities through passion and business networks, within the limited means of financial and social capital resources. Entrepreneurs make sense of personal and formal networks to connect their business and to gain access to key valuable information and decision makers. Entrepreneurs acknowledged the growing importance of personal and formal networks for entrepreneurial success. This study confirms the finding of another study (Bruderl & Preisendorfer, 1998) on the importance of strong network ties in the mix of weak and strong ties. This study extends that finding to the cases being investigated here by demonstrating the mechanism that connects strong ties to a positive performance. The example cases of Invitro Tech (personal network and trust), Wafergen Biosystems (formal and business networks and trust), and Innobiologics (expert references and formal networks) confirm that strong network ties play a crucial role in the resource acquisition process, which is one of the key entrepreneurial processes affecting a firm's performance. This clear contribution enriches the notion posited by some studies that networking contributes to the entrepreneur's ability to discover opportunities, find resources and gain legitimacy (Elfring & Hulsink, 2001; Johannisson, 1998; Aldrich, 1989; Baum et al., 2000). Consequently, new firms have limited resources and have to cope with the *liability of newness* (Stinchcomb, 1965), such as lack of funding and access to human capital, this thesis complements Minniti's (2008) while the government can help to intervene by shaping and positioning entrepreneurial friendly policies and supports.

Companys and McMullen (2007) further explain that changes in the political environment (political stability) and the policies of the government could spark an entrepreneurial action that may lead to entrepreneurial opportunity. This finding confirms the notions of Busenitz et al. (2000), which suggest that the regulatory dimension of the institutional profile consists of laws, regulations, and government policies that provide support for new businesses, reduce the risks for individuals starting a new company, and facilitate entrepreneurs' efforts to acquire resources. Additionally, the finding of this thesis confirms the views of Dana (1990), Fogel (2001), Baumol (1993, 2005), North (1990, 2005), and Bruton and Ahlstrom (2003) that highlighted the relationship between institutional support and entrepreneurship activities, suggesting that productive entrepreneurship will be at low levels where the incentives supporting it are weak, compared with the good and effective policies that facilitate entrepreneurship activities where the incentive deliberately enhances the process of stimulating business activities. The theory of opportunity creation conceptualized in this

study posits that one's value and cultural belief systems display as central sociocultural constructs. Entrepreneurs are continually embedded with cultural learning influencing their values, which are thus translated in their entrepreneurial activities. These value and belief systems were demonstrated across all the cases, affecting their behavioural actions towards opportunities, and this supports Bygrave & Minniti's (2000) notion that cultural values may play a role in the extent of entrepreneurial activity in a country. The value of trust was pre-eminent in the stories narrated and interpreted in the three cases of Innobiologics, Invitro Tech and Wafergen, connecting the link of trust with the social relationship/personal and business exchange. Trustworthy behaviour migrates across different cultures of Malaysian biotech setting. Here, entrepreneurs enact and negotiate beliefs and interpretations to construct shared meanings and common goals that can be in the form of wealth and business opportunities. This contributes to and extends the work of others, such as Fletcher (2007), who argues that narrative analysis using such theories as 'reader response' helps to answer theoretically why entrepreneurship processes migrate across culture and context.

Another potential mediator of the effects of socially generated information on opportunity discovery is the entrepreneurs' individuals' beliefs. Individuals' beliefs can successfully accomplish specific tasks that individual undertake (e.g. Bandura, 1997), and it has been found to play an important role in many forms of behaviour, including entrepreneurship in the biotechnology industry in Malaysia. A finding of this study demonstrated that individuals' beliefs influenced positive behavioural outcomes demonstrating their identity and their business identity, hence supporting the findings of Markman et al. (2002) that inventors high in self-efficacy were more likely to become entrepreneurs than inventors low in self-efficacy. A further key contribution of the study extends to another large body of research findings that indicate that confidence does indeed "sell" and people high in this dimension tend to have broader social networks and to be more popular than people lacking in self-assurance (e.g. Baron et al., 2005). Prior knowledge, experience and social learning, shape the personality and identity of entrepreneurs. Newly refined identity emerges in the event that activities, practices, and values of entrepreneur's social interactions change. Such evolutionary process allows family funded biotech entrepreneurs with limited financial and social capital, to re-combine limited resources effectively. Additionally, in the case of personally funded case, the entrepreneur's passion influenced idea generation encouraging (alertness) to valuable and sometimes useful cues. Cues or information extracted from sources such as reading, social interactions, and research leads to potential business opportunities.

Consequently, in critical decision making and when facing uncertain environmental conditions, entrepreneurs demonstrate the ability to perform different roles of knowledge

acquisition through reading, researching, and personal observation to acquire relevant and valuable information extracted from the surrounding environments. In this case, biotech entrepreneurs recognise business opportunities by gathering information from multiple sources which includes retrospective evidence and experience and interpreting it with critical judgements. While, alert entrepreneurs have internal and external capabilities, i.e. intellectual and social capital, to be ready for opportunities (Puhakka, 2011), more importantly they are capable of translating pieces of cues from market feedback, demands and trends and information into a potential ideas/solutions leading to business opportunities. The outcomes of the analysis suggest that an individual's experience is accumulated into a stock of knowledge that can be used to interpret incoming information in a way that differs from the perceptions of the general public. More specifically, prior knowledge (example of Haji Yusof, PBT's scientist) helps entrepreneurs (PBT owners) build an idiosyncratic cognitive structure and employ a more complex ways of sensing and creating business opportunities.

Additionally, the enactment notion in thesis framework, contributes to better explanation of an entrepreneur's ability to spot and create business opportunities using resources of personal and formal networks to gain access to valuable key information and decisions. This is demonstrated through the entrepreneur's role of scanning the business environment and interpreting the valuable information into actions. Opportunity creation is the interplay of different and selective actions, for example an entrepreneur's participation in international exposition and the action of building business networks. The network resources acquired during the network building process may not be immediately useful to entrepreneur's business, yet, in the future the information and key contacts, could facilitate an entrepreneur's future business needs. The notion of enactment is helpful for understanding networks. The action of enactment, according to Weick (2001), means probing something to see how it reacts. Notwithstanding the importance of networks, are commonly utilised to facilitate business ventures. To satisfy the audience (in this case the customers) entrepreneurs create rules, routines, norms, and ways of working which work for them in getting things done effectively. Through the social context notion, rules, routines and norms could easily be transferred between one to another. Entrepreneurs also learn from their customers. Customer provides them with a set of behavioural cues and patterns in which entrepreneurs could analyse and interpret it. The needs and wants of customers differ, while adopting and managing these diversities to build closer business relationship means entrepreneurs might need to reform and shape their strategies accordingly. Nevertheless, entrepreneur's identity and personality are greatly influenced by the diversity of societal and business values. Social learning process encourages identity assimilation thus enriching

entrepreneur's identity in recognising and creating business opportunities. Despite being an emerging theme and unexpected finding in the thesis, the entrepreneurial opportunity creation framework shares the view that socio-cultural values such as religious beliefs influence an entrepreneur's action and decision to recognize and create business opportunities. In recent years, studies on opportunity discovery and creation have gained much interest (e.g. Aldrich & Ruef; 2006; Shane, 2000, 2003; Shane & Venkataraman, 2000; Venkataraman, 1997; Zahra et al., 2005), yet there is still a deficiency on the examination of the influence of religious belief systems on entrepreneurship activities. This study has also, therefore, taken account of religious belief systems and its role in shaping the identity or venture identity of entrepreneurs.

9.2 Key Contributions

9.2.1 Theoretical Contributions

The similarity and convergence of this study to the research on opportunity discovery and creation has been made explicit. This research makes several important contributions. The investigation contributes to a theoretical understanding of the important role of opportunity discovery and opportunity creation within the field of entrepreneurship by explaining how opportunities are seen and enacted in the context of the biotechnology industry in Malaysia. Firstly, the process evolves from the entrepreneur's personal and professional identity. The function of the framework enables one to understand that prior knowledge and experience from the business and social activities, practices and roles in social interactions, stimulates strong personality and identity within entrepreneurs. Hence, when activities, practices, and roles in social interactions change, a reformulated identity emerges. Such evolutionary processes of network and social interactions allow family funded biotech entrepreneurs with limited financial and social capital, to re-combine limited resources effectively. Additionally, in the case of personally funded case, an entrepreneur's passion shapes interest towards idea generation leading to important and sometimes relevant cues. Cues or information extracted from sources such as reading, social interactions, and research give ways to interesting outcomes that can be translated into potential business opportunities. Interestingly, it is possible to argue that entrepreneurs see business opportunities better than non-entrepreneurs because they cognitively process information related to opportunities in a more "open-way" (Puhakka, 2011). Furthermore, entrepreneurs simply frame the same stimuli differently than non-entrepreneurs. While the analysis and findings reflects than biotech entrepreneurs process useful cues and information, framing the stimuli and translate most of the problems into potential business opportunities.

Entrepreneurs' unique knowledge structures make them especially alert to certain opportunities (Gaglio & Katz, 2001). Hence, cues from market feedback and market demands and trends supply entrepreneurs with valuable sources of information to make timely decisions about their businesses. Consequently, the individual's ability to create opportunities depends largely on how effectively they scan the environment. Engaging sensemaking in answering entrepreneurship issues leads one to appreciate the role of plausibility. Sensemaking is about making people believe in what you say by producing socially accepted good or convincing stories. It is what Weick (2001) describes as coherence, how events hang together; certainty that is sufficient for present purposes, and credibility. Furthermore, through sensemaking, the link can be seen between an entrepreneurs' ability to utilise limited resources (i.e. capital, knowledge, and personal and formal networks) to gain access to valuable key information and decisions, and their ability to create sensible actions to recognize business opportunities. In spite of the limited available resources, entrepreneurs create on-going projects. This provides an explanation that experience for entrepreneurs is an evolving process and requires a real-life strategy of making things happen and making decisions in unpredictable environments (Rae, 2007). This is novel and distinctive theoretically because sensemaking theory has not been widely applied in entrepreneurship. However, theoretically, the thesis findings sheds light on and enriches earlier views and notions on entrepreneurial opportunity discussed and debated in the wider entrepreneurship study context by demonstrating how opportunities are 'seen' and created in the biotech sectors.

Secondly, entrepreneurs demonstrate the uniqueness of knowledge acquisition in the event of uncertainties. In this situation, individual entrepreneurs, secure valuable evidence and experience, reshaping it during the business decision-making process. While, alert entrepreneurs have internal and external capabilities, i.e. intellectual and social capital, to be ready for opportunities (Puhakka, 2011), more importantly they are capable of translating pieces of cues from market feedback, demands and trends and information into a potential ideas/solutions leading to business opportunities. The outcomes of the analysis suggest that an individual's experience is accumulated into a stock of knowledge that can be used to interpret incoming information in a way that differs from the perceptions of the general public. More specifically, prior knowledge (example of Haji Yusof, PBT's scientist) helps entrepreneurs (PBT owners) build an idiosyncratic cognitive structure and employ a more complex schema, which is characterised by extensive cross-links to other schema (Ardichvili et al., 2003; Gaglio & Katz, 2001). Consequently, entrepreneurs, and especially successful biotech entrepreneurs, differs from the non-entrepreneurs in terms of entrepreneurial alertness that shape them to recognize and create profit opportunities.

Finally, through the social context of sensemaking, rules, routines and norms could easily be transferred between one to another. The value of time is shaped through the influence of socio cultural learning process. Notwithstanding, entrepreneurs also learn from their customers. External factors such as the customers provide them with a set of behavioural cues and patterns in which entrepreneurs analyse and interpret it. The needs and wants of customers differs, while adopting and managing these diversities to build closer business relationship means entrepreneurs might need to reposition their approaches differently. Nevertheless, entrepreneur's identity and personality are greatly influenced by the diversity of cultural values and norms. In the Malaysian context, identity is influenced by the business values shaped by the dominant personalities and characters of different actors. At a theoretical level, the thesis draws upon sensemaking theory and the concepts of entrepreneurial opportunity creation to extend the work in the field of entrepreneurship study.

9.2.2 Methodological Contribution

The second contribution is the methodological contribution to entrepreneurship research. The applied methodology used in this study is the interpretive inquiry approach, with the inclusion of the personal observation method. Well-established interpretive tradition exists within the social sciences; however, it is only in recent years that interpretive research in entrepreneurship has emerged (see, for example, Bouchikhi, 1993; Chell & Pittaway, 1998; Costello, 1996; Hines & Thorpe, 1995; Johannisson, 1995; Rae, 2000; Rae & Carswell, 2000). In the interpretive approach, entrepreneurship is viewed as a process of sensemaking in which new ideas and possibilities become enacted, selected and legitimated until potential users finally accept them. Inspired by Weick (1995) and Gadamer (1994), the interpretive approach in entrepreneurship study has been followed by many researchers including Lavoie (1991), Gartner (1993), and Bjerke (2007), and the key assumptions are that entrepreneurship should be understood by studying culturally embedded participants while stressing theoretical holism.

The study therefore employs an interpretive inquiry approach and the three key areas in analysing and interpreting data, following the method suggested by Limb and Dwyer (2001), and Rogers and Viles (2003). The interpretive approach process in this study involves interpreting symbolic forms, narrative, arguments, and conversation within the research context of biotech entrepreneurs. The thesis presents the central issues of entrepreneurship and biotechnology by systematically defining the research design involving a framework for the collection and analysis of data, and issues reflecting decisions about the priority given to

a range of dimensions of the research process (Bryman, 2008). Thomson et al. (1989) argue that the world of 'lived experience' does not always correspond to the world of objective description because objectivity often implies trying to explain an event or experience as separate from its contextual setting. By using the qualitative research method, the study was able to answer the questions about why and how biotechnology entrepreneurs are affected by constructing events that go on around them. The importance of utilising this research method within the entrepreneurship domain is reinforced by Gartner and Birley (2002: 387): 'It is our opinion that many substantive issues in entrepreneurship are rarely addressed, and that many of the important questions in entrepreneurship can only be asked through qualitative methods.' Therefore, to address the complex nature of entrepreneurial behaviour, an interpretive inquiry approach was also established to interpret the data.

Methodologically, this study is reliant on interviews where locating meaning is the essential interpretive apparatus. The understanding gained in addressing the phenomena of entrepreneurial opportunities in biotechnology draws on the interpretive perspective in undertaking analysis; it has assisted in focusing on the emotion and interpretation dimension of entrepreneurs' behavioural actions, and so is valid in this respect. Prasad (1993) argues that both the method of data collection and the perspective used to examine the data provide innovation in methodology. This thesis draws on schemes of meaning, interpretation and definition. To render visible the entrepreneurial behaviours and actions of the entrepreneur, data was analysed in a 'creative' manner, engaging interviews and personal observations. The analysis and discussions established three cases that arise from three different business contexts, namely government funded entrepreneurs, personally funded entrepreneurs and family funded entrepreneurs, mapping all the key themes together into coherent and theoretically connected stories. Using a case study approach in entrepreneurship study has benefits because it examines the contemporary or on-going phenomena that are not divorced from their real-life context (Yin, 2003; Tsoukas, 1989). This study has also used multiple sources of evidence in case studies, namely industrial reports (Ernst & Young, MBC, and Malaysian Industrial Reports), structured interviews, in-depth interviews, and observations. These multiple sources, suggests Yin (2009), allow an investigator to address a broader range of historical and behavioural issues, most importantly developing converging lines of inquiry, through a process of triangulation and corroboration. Hence, any case study finding or conclusion is likely to be more convincing and accurate if it is based on several different sources of information, following a corroboratory mode (p.116). This study has contributed to methodological insight by doing so.

9.2.3 Policy Contributions

The approach in this thesis is complementary to other studies that attempt to illuminate entrepreneurial activity within a nation. Furthermore, at the policy level, this study offers a coherent summary of evidence regarding interventions that stakeholders can use in assessing and considering whether to introduce and/or redesign government policies to enhance the lives of citizens by increasing biotech research and commercialization activity among scientists and others. This thesis highlights not only what is known but also what is unknown concerning government intervention. This is made possible from the data of the respondents' interviewed. While, information can be used by those who seek to shape policy, particularly Malaysians themselves, including scientists, and by scholars who seek to understand the nature and impact of government's intervention. Additionally, this study contributes by providing opportunity to gauge the extent to which government policies have coevolved, conflict and/or complement each other (Kaiser and Prange, 2004). Many countries, including Malaysia, are now contemplating further what they need to do to promote a vibrant entrepreneurship culture and increase the supply of new entrepreneurs (and hence new business creations). Most entrepreneurial development initiatives continue to be influenced around programs to enhance individuals' competency skills, integrate entrepreneurship into national economic development efforts, use the education system to shape and encourage future entrepreneurs, incubate entrepreneurial firms, invest in diverse sources of activities as well as creating the infrastructures, and create a competitive tax policy and regulatory climates.

To move forward, this study posits to close the gap of needs between biotech policy makers and entrepreneurs in recognizing and creating business opportunities. Shane (2012) posits that we have little more understanding of the process by which people exploit opportunities within existing organizations than we had a decade ago. Consequently, an effective policy helps the government to address the issues of resource limitation, and to cope with the liability of newness (Stinchcomb, 1965) and the liability of smallness (Aldrich & Auster, 1986) among biotech entrepreneurs in Malaysia. This study helps to shape better the development of the research in the areas of discovery and creation as the domains of entrepreneurship academic inquiry.

9.3 Research Limitations

The study has offered an evaluative perspective on the process of opportunity creation, and was conducted in a biotech industry setting through respondents' interviews. As a direct

effect of this methodology, the study encountered a number of limitations, which need to be considered. Methodologically, it should be noted that this is a case study, not a large-scale survey study, and as such it is prudent to remember Yin's (2009) concerns that case studies provide little basis for scientific generalization. To address this limitation is not simple (Kennedy, 1976), but what this study does do is make it possible to generalize to theoretical propositions though not to populations or universes (Yin, 2009). It is also possible that the sample set could have been more diverse in multiple industries, to gain insight into different conventions and contexts, particularly with regard to opportunity discovery and creation. The differences between industries might have rendered visible the differences in conformity where a concentrated effort might not have done.

Furthermore, another main limitation of this study is that the data is cross-sectional in nature. Longitudinal data would show how prior knowledge and experience, and the personal and formal networks of entrepreneurs evolve over time, as well as how the weak network ties of entrepreneurs become strong ties. It would highlight the conditions under which an entrepreneur becomes locked into these strong relationships and how these locked-in situations in turn influence their ability to recognize and create profit opportunities and mobilize their limited resources. Consequently, the longitudinal approach may show how the entrepreneurs who find themselves in such a situation manage their networks in an attempt to find a way out. It is also interesting to observe the evolution of knowledge and experience that may drive entrepreneurs in different business directions. It is pertinent to understand what kind of information and sociocultural learning flow through the networks to an entrepreneur and how this information and learning are processed in a bid to identify and create opportunities.

9.4 Future Research

The scale of this debate is therefore extensive and multifaceted even at the Malaysian context. To generate achievable policy strategies and development aims with regards to entrepreneurial activities, there is need for more case studies at different industrial settings to allow further assessment of local dimensions of the subject. Exploring the following as future research strategies can facilitate the attainment of this goal. There is room to delve further into the complexity of the study of entrepreneurial opportunity creation. As a result, two areas for additional research are proposed. First, further studies exploring the role and process of entrepreneurial opportunity in large multinational corporations (MNCs) compared with other government established institutions, such as universities and research institutes, would be particularly informative, as this would further clarify linkages between these two

entities. Analysis distinguishing between opportunity discovery and creation in different institutions and set-ups help developed an insight into the areas of divergence. Second, a suggestion for research is around the need to draw out the sociocultural aspects of entrepreneurs' beliefs systems and how they have serious implications for future decisions about engaging in any profitable activities. There is a growing body of research connecting sociocultural elements and entrepreneurship and therefore a comparative cultural perspective would be invaluable. Overall, future investigations that address these two areas of study would advance the research started here, providing further understanding of both entrepreneurial opportunity discovery and creation and the intersection between the two. Overall, this study provides discourse for further intellectual debate.

9.5 Conclusion

This study makes several contributions in the fields of entrepreneurship. First, it answers the calls for more research on entrepreneurial opportunity mentioned throughout the thesis (Dimitratos and Jones 2005; Ellis 2008; Young, Dimitratos, and Dana 2003; Zahra, Shane, 2012). Second, it indicates how network ties, activeness and alertness, and prior knowledge affect opportunity discovery and creation. Third, the study identifies the primary context in which family funded entrepreneurs recognize business opportunities in biotech market entry. The thesis findings suggest that biotech entrepreneurs mainly recognize business opportunities by establishing new formal ties, with existing informal ties and family ties having a less significant role.

The results of earlier studies on entrepreneurial opportunity creation have not been conclusive. By focusing, on the one hand, on the individual, institutional support, and sociocultural factors, and, on the other hand, on the discovery and creation of opportunities through sensemaking notions, this research has been able to reconcile the deficiencies in findings about the processes that drives entrepreneurs' creation of business opportunities. This thesis found that passion, prior knowledge, and career experience and business networks have positive effects on opportunity, but that they are closely connected to the entrepreneur's ability to address the issues of resource limitation and to cope with the *liability of newness* (Stinchcombe, 1965). This suggests the need for entrepreneurs to manage institutional support effectively, as firms that operate in an environment that is rich in institutional support benefit more because it facilitates the discovery and creation of opportunities.

This conclusion follows logically from the view that this thesis puts forward, that entrepreneurs discover and create opportunities shaped by the influence of the individual, institutional support, and sociocultural forces. However, these three forces are inter-related and embedded within the interpreted events and context demonstrated by the perspective of each entrepreneur. At this juncture, it is hoped that the research undertaken and laid out here offers a worthwhile extension to the existing theory and research, and that it points the way towards future research that can further contribute to the understanding and development of both entrepreneurial opportunity creation and opportunity discovery in the context of other industries or frameworks. Finally, building on the earlier literatures, analysis of data and discussions, I propose an adapted definition of entrepreneurial opportunity as “the discovery, evaluation and exploitation of opportunities in the creation of future goods and services as shaped by the institutional environments and sociocultural contexts of the local community.” This definition is just an extension of the Shane and Venkataraman definition (therefore, say adapted).

References

- Abdul Hamid, S & Sa'ari C.Z. (2011) Reconstructing Entrepreneur's Development Based on al-Qur'an and al-Hadith. *International Journal of Business and Social Science*. Vol.2 (Special Issue) No. 19.
- Abu Bakar, S. (2007) *Factors Contributing to the Success of Biotechnology SMEs in Malaysia*. Unpublished Doctoral Dissertation, Universiti Sains Malaysia.
- Abuduxike, G., Aljunid, S.M., & Sulong, S. (2012). Main challenges in developing biotechnology industry in Malaysia: perspectives from the innovative biotechnology firms. *BMC Public Health*. 12(2): A25.
- Acs, Z.J. & Audretsch, D.B. (2003) Innovation and Technological Change in Z.J. Acs and D.B Audretsch eds. *Handbook of Entrepreneurship Research* pp. 55-79, Kluwer Academic Publishers, UK.
- Acs, Z.J., Audretsch, D.B., Braunerhjelm, P., & Carlsson, B. (2004) The missing link: The knowledge filter and entrepreneurship in endogenous growth. CEPR Discussion paper No. 4783, Center for Economic Policy Research, London.
- Acs, Z.J. & Szerb, L. (2007) Entrepreneurship, economic growth and public policy. *Small Business Economics*, 28 (2-3), p.109-122.
- Agho, A.O., Mueller, C.W. & Price, J.L., (1993) Determinants of employee job satisfaction: an empirical test of a causal model. *Human Relations*, 46 (8), p.1007-1027.
- Ahmad Bustamam, U.S. (2010) Entrepreneurial Growth Process of Malay Entrepreneurs- A Malaysian, *International Journal of Business and Social Science*. 1(3).
- Ahmad, M. (1995) *Business Ethics in Islam*, Islamabad: The International Institute of Islamic Thought.
- Aidis, R., Estrin, S., & Mickiewicz, T. (2008a) Institutions and entrepreneurship development in Russia: a comparative perspective. *Journal of Business Venturing*, 23: 656-672.
- Al Laham, A & Souitaris (2008) Network embeddedness and new-venture internationalization: Analyzing international linkages in the German biotech industry. *Journal of Business Venturing* 23, p.567-586.
- Aldrich, H., & Auster, E. (1986) "Even dwarfs started small: Liabilities of size and age and their strategic implications." In *Research in Organizational Behavior*, vol. 8, ed. B. M. Staw and L. L. Cummings, p.165-198. Greenwich, CT: JAI Press.
- Aldrich, H. E., & Zimmer, C. (1986) Entrepreneurship through social networks. In D. L. Sexton & R. W. Wilson (Eds.), *The art and science of entrepreneurship* (pp. 154–167). Cambridge, MA: Ballinger.
- Aldrich, H.E. (1999) *Organizations Evolving*. Sage, London.

- Aldrich, H.E., & Ruef, M. (2006) *Organizations Evolving* (2nd ed.). Thousand Oaks: Sage.
- Aldrich, H.E. & Zimmer, C. (1986) "Entrepreneurship Through Social Networks." p.3-23 In: D. Sexton and R. Smilor (eds.) *The Art and Science of Entrepreneurship*, New York: Ballinger.
- Aldrich, H.E. (1989) Networking among women entrepreneurs. In O. Hagan, C. Rivchun, & D. Sexton (Eds.), *Women-owned businesses* (p.103-132). New York, NY: Praeger.
- Aldrich, H.E. & Wiedenmayer, G. (1993) From traits to rates: an ecological perspective on organizational foundings. *Adv. in Entrepreneurship, Firm Emergence, Growth* 1:145-95.
- Aldrich, H. & Martinez, A. (2001) Many are called, but few are chosen: An evolutionary perspective for the study of entrepreneurship. *Entrepreneurship Theory and Practice*. 25(4), p.41-56.
- Aldrich, H.E. & Kenworthy, A.L. (1999) The accidental entrepreneur: Campbellian antinomies and organizational foundings. In *Variations in Organization Science: In Honor of Donald T. Campbell*, Baum JAC, McKelvey B (eds). Sage: Thousand Oaks, CA; p.19-33.
- Aldrich, H.E. & Ruef, M. (2006) *Organizations Evolving* (2nd edn). Sage: Thousand Oaks, C.A.
- Al-Qaradawi, Yusuf (2001) *Dawr al-Qiyam wa-al-Akhlaq fi al-Iqtisad al-Islami*, Cairo: Maktabah Wahbah.
- Alvarez, S.A., & Barney, J. (2007) Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*. 1:11-26.
- Alvarez, S.A. & Barney, J.B. (2008) Opportunities, organizations, and entrepreneurship. *Strategic Entrepreneurship Journal*. 2, p.171-173.
- Ardichvili, A., Cardozo, R. & Ray, S. (2003) A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing*. 18 (1), p.105-123.
- Arthur, W.B. (1989) Competing technologies, increasing returns, and lock-in by historical events. *Economic Journal*. 99(394): 116-131.
- Amit, R., Glosten, L., & Muller, E. (1993) Challenges to theory development in entrepreneurship research. *Journal of Management Studies*. 30, p.815-834.
- Anderson, A.R & Smith, R. (2007) The moral space in entrepreneurship: an exploration of ethical imperatives and the moral legitimacy of being enterprising. *Entrepreneurship & Regional Development*. 19, p.479-497.
- Anokhin, S., Victor, J., & Autio, E. (2009) Operationalizing opportunities in entrepreneurship research: Use of data envelopment analysis. *Small Business Economics*, in press. <http://dx.doi.org/10.1007/s11187-009-9227-1>.

- Assael, H. (2004) *Consumer behavior: A strategic approach*. Boston: Houghton Mifflin Company.
- Atkinson, R., Blandy, S., Flint, J. & Lister, D. (2003) *Gated communities in England*, New Horizons research series. London: ODPM.
- Audretsch, D.B. (1995) *Innovation and Industry Evolution*, Cambridge: MIT Press.
- Audretsch, D.B, Grilo, I. & Thurik, A.R, (2007) "Explaining entrepreneurship and the role of policy: a framework", in *The Handbook of Research on Entrepreneurship Policy* Eds D B Audretsch, D.B, Grilo, I & Thurik, A.R. (Edward Elgar, Cheltenham, Glos).
- Austin, J., Stevenson, H., & Wei-Skillern, J. (2006) Social and Commercial Entrepreneurship: Same, Different, or Both? *Entrepreneurship Theory and Practice*. 30:1.
- Bacharach, S. B. (1989) Organizational theories: Some criteria for evaluation. *Academy of Management Review*. 14, p.496-515.
- Badawi, A.A. (2003) The inauguration of incredible India 2003. *Office of the Prime Minister of Malaysia*.
URL:<http://www.pmo.gov.my/WebNotesApp/PMMain.nsf/0/b992c6411770d4c948256df2000e1b18?OpenDocument> [January 23, 2006].
- Badawi, A.A. (2005) BIOMALAYSIA 2005. *Office of the Prime Minister of Malaysia*.
URL:<http://www.pmo.gov.my/WebNotesApp/PMMain.nsf/0/1822c85b82aa7d8948256ff1001034f4?OpenDocument> [January 10, 2006].
- Baker, T., Gedajlovic, E., & Lubatkin, M. (2005) A framework for comparing entrepreneurship processes across nations. *Journal of International Business Studies*. 36: p.492-504.
- Baker, T., & Nelson, R. (2005) Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*. 50(3): 329-366.
- Bandura, A. (1994) Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, p.71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).
- Bandura, A. (1997) *Self-efficacy: the exercise of control*. JH. Freeman, New York.
- Barber, B., (1983) *The Logical Limits of Trust*. Rutgers University Press, New Brunswick, NJ.
- Barreto, I. (2012) Solving the Entrepreneurial Puzzle: The Role of Entrepreneurial Interpretation in Opportunity Formation and Related Processes. *Journal of Management Studies*. 49:2.

- Barney, J.B. (1986) Strategic factor markets: expectations, luck, and business strategy. *Management Science*. 32(10): 1231-1241.
- Bansler, J. & Havn, E. (2006) Sensemaking in technology-use mediation: Adapting groupware technology in organizations. *Computer Supported Cooperative Work*, 15(1), 55–91.
- Baron, R.A. (2008) The role of affect in the entrepreneurial process. *Academy of Management Review*. 33, p.328-340.
- Baron, R.A. (2006) "Opportunity Recognition as Pattern Recognition: How Entrepreneurs 'Connect the Dots' to Identify New Business Opportunities," *Academy of Management Perspectives*. 20(1), p.104-119.
- Baron, R.A., Byrne, D. & Branscombe, N.R. (2005) *Social Psychology*, 11th. ed. Allyn and Bacon, Boston
- Baron, R.A. & S. Shane (2005) *Entrepreneurship: A Process Perspective*, 1st Edition, Mason, Ohio, South-Western Publishing.
- Baron, R.A. (2004) Opportunity recognition: insights from cognitive perspective. In: Butler, J.E (Ed.), *Opportunity Identification and Entrepreneurial Behaviour*. Information Age Publishing, Greenwich, CT.
- Baron, R.A. & Ward, T.B. (2004) Expanding entrepreneurial cognition's toolbox: potential contributions from the field of cognitive science. *Entrepreneurship Theory and Practice*. 26 (6), p.553-573.
- Bartholomew, S. (1997) National systems of biotechnology innovation: complex interdependence in the global system, *Journal of International Business Studies*. 28, p.241-266.
- Batterham, R. (2000) *The chance to change*. Chief Scientist of Australia. Canberra, DISR.
- Baum, J.R., Locke, E.A. & Smith, K.G. (2001) A multidimensional model of venture growth. *Academy of Management Journal*. 44, p.292-303.
- Baum, J.R. & Locke, E.A. (2004) The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*. 89, p.587-598.
- Baum, J., Calabrese, T & Silverman, B.S. (2000) 'Don't Go it Alone: Alliance Network Composition and Start-ups' Performance in Canadian Biotechnology', *Strategic Management Journal*. 21, p.267-294.
- Baum, J.A., & Locke, E.A. (2004) The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*. 89: 587-598.
- Baum, J.A. & Silverman, B.S (2004) Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *Journal of Business Venturing*. 19, p.411-436.

- Baum, J.A. (1996) Organizational ecology, in Clegg, S., Hardy, C. and Nord, S. (eds), *Handbook of Organization*.
- Baumol, W.J. (1990) Entrepreneurship: Productive, unproductive, and destructive. *The Journal of Political Economy*. 98(5), p.893-921.
- Baumol, W.J. (1993) *Entrepreneurship, Management and the Structure of Payoffs*. Cambridge, MA: MIT Press.
- Baumol, W.J. (2005) Entrepreneurship and Invention: Toward Restoration into Microeconomic Value Theory, Mimeo, New York University.
- Baydoun, N., Mamman, A., & Mohmand, A. (1999) The religious context of management practices: The case of the Islamic religion. *Accounting, commerce and finance: The Islamic Perspective Journal*. 3 (1&2), p.59-79.
- Beg, T. (1979) Promotion of Muslim entrepreneurship under state support. *Journal of Objective Studies*. 2(1), p.95-106.
- Benbasat, I. (1984) An Analysis of Research Methodologies in McFarlan, F. W. (Ed.). *The Information Systems Research Challenges*, Boston, MA: Harvard Business School Press, p.47-85.
- Bettis, R. A., & Prahalad, C. K. (1995) The dominant logic: Retrospective and extension. *Strategic Management Journal*, 16(1): 5–14. , May 10, 2012.
- Bhagavatula, S., T., Elfring, Tilburg, A.V, & Van de Bunt, G.G. (2010) "How Social and Human Capital Influence Opportunity Recognition and Resource Mobilization in India's Handloom Industry," *Journal of Business Venturing*. 25(3), p.245-260.
- Bhave, M. (1994) A process model of entrepreneurial venture creation. *Journal of Business Venturing*. 9(3), p.223-242.
- Bhide A.V. (2000) *The Origin and Evolution of New Business*. Oxford University Press.
- Bhide, A.V. (1999) *How Entrepreneurs Craft Strategies That Work*. Boston, MA: Harvard Business School Press.
- Bierly, P.E., Kessler, E.H., & Christensen, E.W. (2000) Organizational learning, knowledge, and wisdom. *Journal of Organizational Change Management*. 13: 595-618.
- Binks, M., Vale, P. (1990) *Entrepreneurship and Economic Change*, McGraw-Hill, London.
- BIOTEK (2001) *Priority setting in biotechnology under 8th Malaysia Plan (2nd ed.)*. Putrajaya: the Ministry of Science, Technology and Innovation (MOSTI).
- Birch, D. (1979) *The Job Generation Process*. MIT Press, Cambridge, MA.

- Birley, S. (1985) The role of networks in the entrepreneurial process. *Journal of Business Venturing*. 3(1), p.107-117.
- Bjerke, B. (2007) Face-to-Face Research: Interviews, Conversations and Dialogues in Gustavsson (e.d.). *The Principles of Knowledge Creation*. Edward Elgar.
- Black, T. R. (1999) *Doing quantitative research in the social sciences: An integrated approach to research design, measurement, and statistics*. Thousand Oaks, CA: SAGE Publications, Inc., p.118.
- Blackford, M.G. (2003) *A history of small business in America*. 2nd Ed. Chapel Hill: University of North Carolina Press.
- Blackburn R. A. & Smallbone D. (2008) Researching small firms and entrepreneurship in the UK: Developments and distinctiveness, *Entrepreneurship Theory and Practice*. Vol. 32, No. 2, p.267-288.
- Blaikie, N.W.H. (2000) *Designing social research: The logic of anticipation*. Cambridge, MA: Polity Press.
- Blalock, H. M. (1979) *Social statistics* (2nd ed.). New York: McGraw-Hill.
- Blau, P.M. (1964) *Exchange and power in social life*. Basic Books, New York.
- Blau, P.M. & David M. (1987) A Time Series Analysis of Self Employment in the United States, *Journal of Political Economy*, 95(3), p.445-467.
- Blaug, M. (2000) Entrepreneurship before and after Schumpeter. In R. Swedberg (Ed). *Entrepreneurship: The social science view* (p.76-88). New York: Oxford University Press.
- Blumer, H. (1954) What is Wrong with Social Theory. *American Sociological Review*. 18 (1954): 3-10.
- Boardman, C.M., Bartley, J.W. & Ratliff, R.L. (1981) 'Small business growth characteristics'. *American Journal of Small Business*. 5(3), p.33-45.
- Boettke, P. & Coyne, C. (2007) Entrepreneurial behavior and institutions. In M.Minniti (Ed.), *Entrepreneurship: The engine of growth, Vol. 1 perspective series* (p.119-134). Westport, CT: Praeger Press—Greenwood Publishing Group.
- Bogdan, R. & Taylor, S. J. (1975) *Introduction to qualitative research methods: A phenomenological approach to the social sciences*, New York: John Wiley and Sons.
- Bouchikhi, H. (1993) A constructivist framework for understanding entrepreneurship Performance. *Organization Studies*. 14(4), p.549-570.
- Borch, O.J. and Arthur, M.B. (1995) 'Strategic Networks among Small Firms: Implications for Strategy Research Methodology', *Journal of Management Studies*. 32,p.419-442.

- Bosma, N., Jones, K., Autio, E., & Levie, J. (2008) Global Entrepreneurship Monitor 2007 Executive Report. Babson College, London Business School, and Global Entrepreneurship Research Consortium (GERA).
- Bowen, H. & De Clercq, D. (2008) Institutional context and the allocation of entrepreneurial effort. *Journal of International Business Studies*. 39 (4), p.747-767.
- Brännback, M., Carsrud, A., Elfving, J. & Krueger, N.K. (2006) Sex, [drugs], and entrepreneurial passion? An exploratory study. Paper Presented at the Babson College Entrepreneurship Research Conference. Bloomington, IN.
- Branzei, O., & Zietsma, C. (2003) *Entrepreneurial love: The enabling functions of positive illusions in venturing*, Paper presented at the Babson-Kauffman Entrepreneurial Research Conference, Wellesley, MA.
- Bridge, S., O'Neill, K. & Cromie, S. (2003) Understanding Enterprise, Entrepreneurship and Small Business, Palgrave Macmillan, Basingstoke, Hants.
- Brown, A. D., Stacey, P., & Nandhakumar, J. (2007) Making sense of sensemaking narratives. *Human Relations*. 61(8): 1035-1062.
- Bruderl, J., Preisendörfer, P. & Ziegler, R. (1992) Survival Chances of Newly Founded Business Organizations. *American Sociological Review*. 57: 227-242.
- Bruderl, J. & Preisendorfer, P. (1998) Network support and the success of newly founded businesses. *Small Business Economics*, 10 (1), 213-225.
- Bruton, G. D. & Ahlstrom, D. (2003) An institutional view of China's venture capital industry—Explaining the differences between China and the West. *Journal of Business Venturing*, 18: 233-259.
- Bryman, A. (2001) *Social Research Methods*. Oxford, UK: Oxford University Press.
- Bryman, A. (2004) *Social research methods*. (2nd ed.) Oxford, UK: Oxford University Press.
- Bryman, A. (2008) *Social research methods*, 3rd Ed, Oxford University Press.
- Buenstorf, G. (2007) Creation and pursuit of Entrepreneurial Opportunities: An Evolutionary Economics Perspective. *Small Business Economics*, 28:323-337.
- Bullock, M.P.D. (1983) *Academic Enterprise, Industrial Innovation and the Development of High Technology Financing in the United States*. London: Brand Bros.

- Burgelman, R.A. (1983) A Process Model of Internal Corporate Venturing in the Diversified Major Firm, *Administrative Science Quarterly*, 28, 223-244; Burgelman, Robert A. (1984): "Designs for Corporate Entrepreneurship", *California Management Review*, 26, p.154-166.
- Burke, P. J (2004) Identities and Social Structure: The 2003 Cooley-Mead Award Address. *Social Psychology Quarterly*, 67(1): 5–15.
- Burt, R.S. (2004) "Structural Holes and Good Ideas," *American Journal of Sociology*. 110(2), p.349-399.
- Burton, D., Sorensen, J., & Beckman, C. (2002) Coming from good stock: Career histories and new venture formation, *Social Structure and Organisations Revisited* 19: 229–262.
- Busenitz, L.W. (1996) Research in entrepreneurial alertness. *Journal of Small Business Management* 35, p.35-44.
- Busenitz, L.W. & Lau, C.M. (1996) A cross-cultural cognitive model of new venture creation. *Entrepreneurship, Theory and Practice* Summer, p.25-39.
- Busenitz, L. W., Gomez, C., & Spencer, J. W. (2000) Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management Journal*, 43(5): 994-1003.
- Bygrave, W., & Minniti, M. (2000) The social dynamics of entrepreneurship. *Entrepreneurship Theory and Practice*, 24(3), p.25-36.
- Bygrave, B. (2004) The entrepreneurial process. In W. Bygrave & A.E. Zacharkis (Eds.), *The portable MBA in entrepreneurship* (pp. 1-28). Hoboken, NJ: John Wiley & Sons.
- Bygrave, W. (2006) The entrepreneurship paradigm (I) revisited. In H. Neergard & J. Parm Ulhoi (Eds.), *Handbook of qualitative research methods in entrepreneurship* (pp. 17–48). Cheltenham, U.K: Edward Elgar Publishing, Inc.
- Cantillon, R. (1755) *Essai sur la nature du commerce en generale*. London, U.K: Macmillan.
- Cardon, M.S., Wincent, J., Singh, J. & Drnovsek, M. (2009) The nature and experience of entrepreneurial passion. *Academy of Management Review*, Vol. 34, No. 3, p.511-532.
- Cardon, M. S., Zietsma, C., Saporito, P., Matherne, B., & Davis, C. (2005) A tale of passion: New insights into entrepreneurship from a parenthood metaphor. *Journal of Business Venturing*, 20: 23-45.
- Cardon, M.S., Stevens, C.E., & Potter, D.E. (2009) Misfortunes or mistakes? Cultural sense-making of entrepreneurial failure. *Journal of Business Venturing*, (26), p.79-92.
- Cardon, M.S., Gregoire, D.A., Steven, C.E. & Patel, P.C. (2012) Measuring entrepreneurial passion: Conceptual foundations and scale validation, *J. Bus. Venturing* (2012), doi:10.1016/j.jbusvent.2012.03.003.

- Carr, D. (2003) Character and Moral Choice in the Cultivation of Virtue. *Philosophy*, Vol. 78, Issue 02, DOI: <http://dx.doi.org/10.1017/S0031819103000251>
- Carroll, G. & Mosakowski, E. (1987) The career dynamics of self-employment. *Administrative Science Quarterly*, 32, p.570-589.
- Carson, D.J., Cromie, S., McGowan, P. & Hill, J. (1995) *Marketing and Entrepreneurship in SMEs: An Innovative Approach*, Prentice-Hall, London.
- Carter, N.M., Gartner, W.B., Shaver, K.G., & Gatewood, E.J. (2003) The career reasons of nascent entrepreneurs. *Journal of Business Venturing*, 18(1), p.13-39.
- Cassiman B, & Veugelers R. (2006). In Search of Complementarity in Innovation Strategy: Internal R&D and External Knowledge Acquisition. *Management Science*, 52:68-82.
- Casson, M.C. (2003) *The entrepreneur*. NY: Edward Elgar Publishing.
- Casson, M. (1982) *The Entrepreneur*. Barnes & Noble Books, Totowa, N.J.
- Cefis E, Marsili O. (2005) A matter of life and death: innovation and firm survival. *Industrial and Corporate Change*, 14:1167-1192.
- Chamberlain, G.P. (2006) Researching strategy formation process: An abductive methodology. *Quality and Quantity*, 40: 289-301.
- Chaston, I. & Mangles, T. (1997) 'Core capabilities as predictors of growth potential in small manufacturing firms', *Journal of Small Business Management*. 35(1), p.47-57.
- Cheah, H. (1990) Schumpeterian and Austrian entrepreneurship: Unity within duality. *Journal of Business Venturing*, 5(6), p.341-347. [http://dx.doi.org/10.1016/0883-9026\(90\)90010-Q](http://dx.doi.org/10.1016/0883-9026(90)90010-Q).
- Chee, P.L. (1990) "Promoting Small Industries: The Malaysian Experience." In *Promotion of Small-scale Industries and Strategies for Rural Industrialisation: The Malaysian Experience*. Kuala Lumpur: Friedrich Ebert Stiftung. p.25-63.
- Chell, E., Harworth, J. & Brearly, S. (1991) *The Entrepreneurial Personality: Concepts, Cases and Categories*. Routledge, London
- Chell, E., & Pittaway, L. (1998) The social constructionism of entrepreneurship, proceedings of the 21st ISBA National Small Firms Policy and Research Conference, Durham University Business School.
- Chen, X.P., Yao, X. & Kotha, S. (2009) Passion and preparedness in entrepreneurs' business plan presentations: a persuasion analysis of venture capitalists' funding decisions. *Academy of Management Journal*. 52, p.199-214.

- Chiles, T.H., Bluedorn, A.B., & Gupta, V.K. (2007) Beyond creative destruction and entrepreneurial discovery: A radical Austrian approach to entrepreneurship. *Organization Studies*, 28 (4), p.467-493.
- Choi, Y.R., & Shepherd, D.A. (2004) Entrepreneurs' decisions to exploit opportunities. *Journal of Management*, 30: 377-395.
- Chua, J. H., Chrisman, J. J., & Sharma, P. (1999) Defining the family business by behavior. *Entrepreneurship Theory and Practice*, 23(4), p.19-39.
- Cohen, W. & Levinthal, D. (1990) Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly* 35 (1), p.128-152.
- Cohen, D.J., & Crabtree, B.J. (2006) *Qualitative research guidelines project*. Retrieved from <http://www.qualres.org/>
- Collins, O. & Moore, D. (1964) *The Enterprising Man*. East Lansing: Michigan State University.
- Companys, Y.E. & McMullen, J.S. (2007) Strategic entrepreneurs at work: The nature, discovery and exploitation of entrepreneurial opportunities. *Small Business Economics*, 28: 301-322.
- Cooper, A.C., Folta, T.B. & Woo, C. (1995) Entrepreneurial information search. *Journal of Business Venturing*, Vol.10, Issue 2, p.107-120.
- Cooper, A.C. & Bruno A.V. (1975) Predicting performance in new high-technology firms, *Proceedings of the 35th Annual Meeting of the Academy of Management*, August, p. 426-428.
- Cope, J. & Watts, G. (2000) Learning by doing: an exploration of experience, critical incidents and reflection in entrepreneurial learning, *International Journal of Entrepreneurial Behaviour and Research* 6(3): 104-124.
- Corbett, A.C. (2007) Learning asymmetries and the discovery of entrepreneurial opportunities. *Journal of Business Venturing*, 22, p.97-118.
- Costello, N. (1996) Learning and routines in high-tech SMEs: Analyzing rich case study material. *Journal of Economic Issues*, 30 (2), p.591-597.
- Coviello, N. (2006) "The Network Dynamics of International New Venture," *Journal of International Business Studies* 37(5), p.713-731.
- Creed, W.E.D Miles, R.E. (1996) Trust in organizations: a conceptual framework linking organizational forms, managerial philosophies, and the opportunity costs of controls. In: Kramer, R.M Tyler, T.R. (Eds.), *Trust in Organizations: Frontiers of Theory and Research*. Sage Publications, London, p.16-38.

- Creswell, J.W. (2003) *Research design. Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: Sage.
- Creswell, J.W. (2003) *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousands Oaks, California: SAGE Publications.
- Crick, D., & Spence, M. (2005) "The Internationalisation of 'High Performing' UK High-Tech SMEs: A Study of Planned and Unplanned Strategies,"
- Crotty, M. (1998) *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: SAGE Publications Ltd.
- Csikszentmihalyi, M. (1990) *Flow: The psychology of optimal experience*. New York: Harper Perennial.
- Csikszentmihalyi, M., (1996) *Creativity*. HarperCollins, New York.
- Cyert, R.M. & March, J.G. (1963) *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice Hall.
- Daft, R.L Lengel, R.H. (1984) Information richness: a new approach to managerial behavior and organization design. In: Cummings, L.L Staw, B.M. (Eds.), *Research in Organizational Behavior*. JAI Press, Homewood, p.191-233.
- Dalley, J. and Hamilton, B. (2000) 'Knowledge, Context and Learning in the Small Business', *International Small Business Journal*. 18(3): 51-9.
- Daly, P. (1985) *The Biotechnology Business*. New Jersey: Rowman & Allanheld Publishers.
- Davidsson, P. (2003) The domain of entrepreneurship research: Some suggestions. In J. Katz & D. Shepherd (Eds.), *Cognitive approaches to entrepreneurship research* (Vol. 6, pp. 315–372). Oxford, U.K: Elsevier/JAI Press.
- Davidsson, P. (2003) The domain of entrepreneurship research: Some suggestions. *Advances in Entrepreneurship, Firm Emergence and Growth*. 6: 315-372.
- Damasio, A.R. (2003) Fundamental feelings. *Nature*. p.413-781.
- Dana, L.P. (1990) "Saint Martin/Sint Maarten: A Case Study of the Effects of Culture on Economic Development," *Journal of Small Business Management* 28(4), p.91-98.
- Davidsson, P. & Honig, B., (2003) The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18 (3), p.301-331.
- Deeds, D. & Hill, C. (1996) Strategic alliances and the rate of new product development: An empirical study of new biotechnology firms. *Journal of Business Venturing*. 11(1), p.41-58.

- Dees, G. (2001) The Meaning of Social Entrepreneurship. <http://www.caseatduke.org>. Accessed on October 24, 2010.
- de Koning, A. (2003) Opportunity development: A socio-cognitive perspective. In J. Katz & D. Shepherd (Eds.), *Advances in entrepreneurship, firm emergence & growth: Cognitive approaches to entrepreneurship research* (Vol. 6, p. 265-314). Oxford: Elsevier/JAI Press.
- Delmar, F. & Davidsson, P. (2000) "Where do they come from? Prevalence and characteristics of nascent entrepreneurs", *Entrepreneurship and Regional Development*, Vol. 12, p.1-23
- Denison, D., Liet, C. & Ward, J.L. (2004) Culture in Family-Owned Enterprises: Recognizing & Leveraging Unique Strengths. *Family Business Review*, 17:61.
- Denzin, N.S. & Lincoln, Y.S. (1998) 'Introduction: entering the field of qualitative Research', in Denzin, NS and Lincoln, YS (eds.), *The Landscape of Qualitative Research: theories and Issues*, Sage, London.
- De Wever, B., Schellens, T., Valcke, M., & Van Keer, H. (2006) Content analysis schemes to analyze transcripts of online asynchronous discussion groups: A review. *Computer and Education*, 46, p.6-28.
- Dickson, P.H., Weaver, K.M. & Hoy, F. (2006) Opportunism in the R&D alliances of SMES: The roles of the institutional environment and SME size *Journal of Business Venturing* 21: 487–513
- DiMaggio, P. and Powell, W.W. (1991) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality, in W.W. Powell and P. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis*, Chicago: University of Chicago Press, p.63-82.
- Dimov, D. (2007) From opportunity insight to opportunity intention: The importance of person-situation learning match. *Entrepreneurship Theory & Practice*, 31(4): 561-583.
- Dimov, D. (2007b) Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 31(5), p.713-731.
- Dimov, D. (2010) Nascent entrepreneurs and venture emergence: Opportunity confidence, human capital, and early planning. *Journal of Management Studies*, 47(6), p.1123-1153.
- Dobrev, S.D. & Barnett, W.P. (2005) Organizational Roles and Transition to Entrepreneurship. *Academy of Management Journal* 48(3): 433-449.
- Dollinger, M.J. (1984) 'Environmental boundary spanning and information processing effects on organizational performance', *Academy of Management Journal*, 27(2), p.351-368.

- Douglas, D. (2004) Grounded theory and the 'And' in entrepreneurship research. *Journal of Business Research Methods*, Vol. 2 Issue 2, p.59-68.
- Drucker P. (1986) *Innovation and Entrepreneurship*, Harper & Row Publishers.
- Duchesneau, D.A. & Gartner, W.B. (1990) A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing* 5 (5), p.297-312.
- Dutton, J. E., Roberts, L.M. & Bednar, J. (2010) Pathways for Positive Identity Construction at Work: Four Types of Positive Identity and the Building of Social Resources. *Academy of Management Review* 35(2): 265-293.
- Dyer, J.H. & Singh, H. (1998). The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. *Academy of Management Review*, 23:660-679.
- EC Enterprise & Industry (2012). Biotechnology SMEs and Competitiveness. Accessed on 24th December 2012 at http://ec.europa.eu/enterprise/sectors/biotechnology/competitiveness/index_en.htm
- Eckhardt, J.T. & Shane, S.A. (2003) Opportunities and Entrepreneurship. *Journal of Management*. 29 (3), p.333-349.
- Edelman, L. & Yli-Renko, H. (2010) The Impact of Environment and Entrepreneurial Perceptions on Venture-Creation Efforts: Bridging the Discovery and Creation Views of Entrepreneurship. *Entrepreneurship Theory & Practice*. DOI: 10.1111/j.1540-6520.2010.00395.x.
- Edquist, C., & Johnson, B. (1997) *Institutions and Organizations in Systems of Innovation*. In: Edquist, C. (Ed.), *System of Innovation: Technologies, Institutions and Organizations*. London: Pinter/Cassel, p.41-60 (Part I, Chapter 2).
- Eisenhardt, K.M. & Schoonhoven, C.B. (1990) Organizational growth: Linking founding team, strategy, environment and growth among U. S. semiconductor ventures, 1978–1988. *Administrative Science Quarterly*, 35(3), p.504-529.
- Eisenhart, M. & Howe, K. (1992) Validity in Educational Research. In M. Le Compte, W. Millroy, & J. Preissle (Eds.), *The Handbook of Qualitative Research in Education* (p. 642-680). San Diego: Academic Press.
- Eisner, E.W. & Peshkin, A. (1990) *Qualitative Inquiry in Education: The Continuing Debate*, New York: Teachers College Press, Columbia University.

- Elfring, T. & Hulsink, W. (2001) Fighting for Survival and Legitimacy: Growth Trajectories of High Technology Firms in the Netherlands. In: W. Daring, R. Oakey & S. Kauser (eds), *New Technology-based Firms in the New Millennium* ISBN 0-08-043976-4 Elsevier-Pergamon. p.4-25.
- Elfring, T. & Hulsink, W. (2003). Networks in Entrepreneurship: The Case of High-technology Firms. *Small Business Economics*, 21.
- Ellis, R.M. (2010) *Understanding small business networking and ICTs: Exploring face-to-face and ICT-related opportunity creation mediated by social capital in East of England microbusinesses*, Centre for Research in Economic Sociology and Innovation (CRESI) Working Paper 2010-01, University of Essex: Colchester.
- Ellis, P. (2008) *Social Ties and International Opportunity Recognition*. Unpublished manuscript, Hong Kong Polytechnic University.
- Ellsberg, D. (1961) 'Risk, ambiguity, and the Savage axioms'. *Quarterly Journal of Economics*. 75, p.643-69.
- Endres, M. & Woods, C. (2006) Modern theories of entrepreneurial behavior: A comparison and appraisal. *Small Business Economics*. 26(2), p.189-202.
- Ernst & Young. (2000) *Convergence: The biotechnology industry report* (Millennium Edition). New York, NY.
- Etzioni, A. (1963) The epigenesis of political communities at the international level. *The American Journal of Sociology*, 68(4): 407–421.
- Fiet, J.O., Piskounov, A., & Gustafsson, V. (2000) How to decide how to search for entrepreneurial opportunities. Paper presented at the 20th annual Babson College-Kauffman Foundation Entrepreneurship Research Conference, Boston, MA.
- Fiet, J. (1996) "The informational basis of entrepreneurial discovery", *Small Business Economics*. 8(6), p.419-30.
- Fisher, G. (2012) Effectuation, Causation, and Bricolage: A Behavioral Comparison of Emerging Theories in Entrepreneurship Research. *Entrepreneurship Theory & Practice*. DOI: 10.1111/j.1540-6520.2012.00537.x.
- Feldman, M.P. (2001) The Entrepreneurial Event Revisited: An Examination of New Firm Formation in the Regional Context. *Industrial and Corporate Change*, 10, p. 861-891.
- Fletcher, D. E. (2006) Entrepreneurial processes and the social construction of opportunity. *Entrepreneurship and Regional Development*, 18: 421-440.
- Fletcher, D.E. (2007) Toy story: The narrative world of entrepreneurship and the creation of interpretive communities. *Journal of Business Venturing*, 22, p.649-672.

- Fletcher D.E. (2011) A curiosity for contexts: Entrepreneurship, enactive research and auto-ethnography, *Entrepreneurship & Regional Development: An International Journal*, 23:1-2, p.65-76.
- Fogel, G. (2001) An Analysis of Entrepreneurial Environment and Enterprise Development in Hungary, *Journal of Small Business Management* 39(1), p.103-109
- Fontana, A., & Frey, J.H. (2005) The interview: From neutral stance to political involvement. In N. K. Denzin & Y. S. Lincoln (Eds), *The Sage handbook of qualitative research* (3rd ed.), p.695-727. Thousand Oaks, CA: Sage.
- Forstater, M. (1999c) Working Backwards: Instrumental Analysis as a Policy Discovery Procedure. *Review of Political Economy*. 11, p.5-18.
- Foucault, M. (1984) The order of discourse. In Shapiro, M. (ed.), *Language Politics*, Oxford: Basil Blackwell, p.108-138.
- Frijda, N.H. (2005) Emotion experience. *Cognition and Emotion*, 19, p.473-498.
- Frost, P. & Morgan, G. (1983) Symbols and sensemaking: The realization of a framework. In L. R. Pondy, P. J. Frost, G. Morgan, & T. C. Danderidge (Eds.), *Organizational symbolism* (pp. 207–237). Greenwich, CT: JAI Press.
- Frost and Sullivan Report (2009) *Malaysian Biotechnology*. Human Capital Development Report 2009.
- Fuduric, N. (2008) The Sources of Entrepreneurial Opportunities: Individuals & the Environment Doctoral Research, Paper 2 of 5, Department of Planning and Development, Aalborg University, Aalborg, Denmark.
- Gadamer, H.G. (1994) *Truth and method* (Second revised ed., translation revised by J. Weinsheimer and D. Marshall). New York: Continuum (Originally Published as *Wahrheit and methode* by J.C.B Mohr / Paul Siebeck, Tübingen, 1960)
- Gaglio, C.M. & Katz, J.A. (2001) The psychological basis of opportunity identification: entrepreneurial alertness. *Small Business Economics*. 16, p.95-111.
- Gall, M.D., Borg, W.R., & Gall, J.P. (1996) *Educational research: An introduction*. White Plains, NY: Longman.
- Gartner, W.B. (2001) Is there an elephant in entrepreneurship? Blind assumptions in theory development. *Entrepreneurship Theory and Practice*. 25(4), p.27-39.
- Gartner, W.B. (1985) A conceptual framework for describing the phenomenon of new venture creation. *Academy of Management Review*. 10: 696-706.
- Gartner, W.B. (1993) Words lead to deeds: Towards an organizational emergence Vocabulary. *Journal of Business Venturing*, 8: 231-239.

- Gartner, W.B. & Birley, S. (2002) Introduction to the special issue on qualitative methods in entrepreneurship research. *Journal of Business Venturing*, 17(5): 387-95.
- Gartner, W.B., Carter, N.M., Hills, G.E. (2003) The language of opportunity. In: Steyaert, C., Hjorth, D. (Eds.), *New Movements in Entrepreneurship*. Edward Elgar, Northampton, MA, p.103-124.
- Gaglio, C.M. & Katz, J.A. (2001) The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics*, 16(2), p.95-111.
- George, G., Zahra, S.A., & Wood, D.R. Jr. (2002) The effects of business-university alliances on innovative output and financial performance: A study of publicly traded biotechnology companies. *Journal of Business Venturing*, 6(1), p.577-609.
- Gerson, K., & Horowitz, R. (2002) Observation and interviewing: Options and choices in qualitative research. In T. May (Ed.), *Qualitative research in action* (p.199-224). London, UK: SAGE Publications.
- Gilbert, B.A, Audretsch, D.B & McDougall, P. (2004) "The emergence of entrepreneurship policy". *Small Business Economics*. 22: 313-323.
- Gioia, D. A. (2006) On Weick: An appreciation. *Organization Studies*, 27(11), 1709-1721.
- Gioia, D.A., & Chittipeddi, K. (1991) Sensemaking and Sensegiving in Strategic Change Initiation, in *Strategic Management Journal*. 12(6), p.433-448.
- Goffman, E. (1959) *The presentation of self in everyday life*. London, Pelican.
- Gomez, L. (2005, April 25) Up, up and away. *New Straits Times*, supplement.
- Gomez, E.T. & Jomo, K.S. (1997) *Malaysia's political economy: politics, patronage and profits*, Cambridge University Press, New York.
- Goodman, J.P., Meany, J.W. & Pate, L.E. (1992) The government as entrepreneur: Industrial development and the creation of new ventures. In *The state of the art of entrepreneurship*, ed. D.L. Sexton and J.D. Kasarda, Boston: PWS Kent, p.68-88.
- Gormley, R. (2009, March 17) Europe's biotech sector seeks EU help with funds. *The Wall Street Journal*.
- Goss, D. (2005) Schumpeter's legacy? Interaction and emotions in the sociology of entrepreneurship. *Entrepreneurship Theory and Practice*, 29: 205-218.
- Goss, D. (2007) Enterprise ritual: A theory of entrepreneurial emotion and exchange. *British Journal of Management*. 19(2), p.120-137.
- Gough, J.W. (1969) *The rise of the entrepreneur*. New York: Schocken Books.

- Grant, P. & Perrin, L. (2002) Small business and entrepreneurial research: Metatheories, paradigms and prejudices. *International Small Business Journal*, 20(2), p.185-211.
- Granovetter, M. (1985) Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91: 53-81.
- Grebel, T., Pyka, A., & Hanusch, H. (2003) An evolutionary approach to the theory of entrepreneurship. *Industry and Innovation*, 10(4), p.493-514.
- Green, J. (2005) Analysing qualitative data. In J. Green & J. Browne (Eds.), *Principles of Social Research* (p.75-89). Berkshire, UK: Open University Press.
- Gregoire, D.A., Barr, P.S., & Shepherd, D.A. (2010) Cognitive processes of opportunity recognition. *Organization Science*, 21: 413-431.
- Grewal, D., Baker, J., Levy, M., & Voss, G. B. (2003) The effects of wait expectations and store atmosphere evaluations on patronage intentions in service-intensive retail stores. *Journal of Retailing*, 79 (4), p.259-268.
- Guba, E.G. & Lincoln, Y.S. (1994) Competing paradigms in qualitative research. In Denzin, N.K. and Lincoln, Y.S. (eds) *Handbook of qualitative research*. California: Sage Publications, p.105-117.
- Gulati, R. & Higgins, M.C, (2003) Which ties matter when? The contingent effects of interorganizational partnerships on IPO success. *Strategic Management Journal* 24, p.127-144.
- Habibis, D. (2006) Ethics and social research. In M. Walter (Ed.), *Social research methods: An Australian perspective* (p.53-82). Melbourne: Oxford University Press.
- Hagen, J.M. & Choe, S., (1998) Trust in Japanese interfirm relations: institutions matter. *Academy of Management Review* 23 (3), p.589-601.
- Hakansson, H. and Snehota, I. (1995) *Developing Relationships in Business Networks*, Routledge, London.
- Hallén L., Johanson, J. & Mohamed, N.S. (1991) Interfirm Adaptation in Business Relationships. *Journal of Marketing*. 55(2), p.29-37.
- Halpern, E.S. (1983) *Auditing naturalistic inquiries: The development and application of a model*. Unpublished Doctoral Dissertation. Indiana University.
- Harrison, R.T., Mason, C.M., & Girling, P. (2004) Financial bootstrapping and venture development in the software industry. *Entrepreneurship & Regional Development*, 16(4), p.307-333.
- Hartley, J.F. (1994) Case studies in organizational research. In C. Cassell and G. Symon (eds), *Qualitative methods in organizational research*. London: Sage.

- Harvey, L. (1997) Qualitative research in information systems-ethnography. A presentation and seminar given to IS honors and Masters research methods students at Curtin University, Semester One 1997.
- Hardin, R. (1991) Trusting persons, trusting institutions. In: Zeckhauser, R.J. (Ed.), *Strategy and Choice*. The MIT Press, Cambridge; Massachusetts; London, p.185-209.
- Harper, D.A. (1996) *Entrepreneurship and the Market Process: An Inquiry into the Growth of Knowledge*. London: Rutledge.
- Hayek, F.A. (1945) The use of knowledge in society. *American Economic Review* 35 (4), p.519-530.
- Hebert, R. & Link, A. (1988) *The Entrepreneur: Mainstream Views and Radical Critiques*. Praeger, New York.
- Henrekson, M. (2007) "Entrepreneurship and institutions" *Comparative Labour Law and Policy Journal*. 28:717-742.
- Henry, J. (1991) *Making sense of creativity*. In: *Creative Management*. London: Henry, J. Sage Publications. p.3-11.
- Hennenberg, S. C., Naude, P., & Mouzas, S. (2009) Sense-making and management in business networks-some observations, considerations, and research agenda. *Industrial Marketing Management*, (39), p.355-360.
- Heong, C.Y. (2004, July 31) Biotech investing a high-risk gamble. *Asia Times Online*. Retrieved October, 18, 2010, from http://www.atimes.com/atimes/Asian_Economy/FG31Dk01.html.
- Hesse-Biber, S.N.m & Leavy, P. (2006) *The practice of Qualitative research*. Thousand Oaks, California: Sage Publications.
- Hill, R.C. & Levenhagen, M. (1995) Metaphors and mental models: Sensemaking and sensegiving in innovative and entrepreneurial activities. *Journal of Management*. 21(6), p.1057-1074.
- Hill, L. (1992) *Becoming a manager: Mastery of a new identity*. Boston: Harvard Business School Press.
- Hindle, K. (2007) *Formalizing the concept of entrepreneurial capacity*. Paper presented at the Refereed Proceedings of the 2007 ICSB World Conference, Finland: Turku School of Economics.
- Hine, D., & Kapeleris, J. (2006) *Innovation and entrepreneurship in biotechnology, An international perspective: Concept, theories and cases*. Edward Elgar Publishing Limited.
- Hines, T. & Thorpe, R. (1995) New approaches to understanding small firm networks - the key to performance, managerial learning and development. *18th ISBA National Small Firms Policy and Research Conference*, Paisley.

- Hoang H. (1997) The consequences of network participation for acquisition and alliance activity in the biotechnology industry. *Academy of Management Proceedings*: p.267-271.
- Hofstede, G.H. (1980) *Culture Consequences: International Differences in Work-related Values*, Sage Publications, London.
- Holcombe, R.G. (2003) The origins of entrepreneurial opportunities. *Review of Austrian Economics*, 16(1), p.25-43.
- Holt, R., & Macpherson, A. (2010) Sense-making, rhetoric and the socially competent entrepreneur. *International Small Business Journal*, 28(1), p.20-42.
- Holtz-Eakin, D. (2000) "Public policy toward entrepreneurship". *Small Business Economics*. 15: 283-291.
- Homans, G. (1958) "Social Behavior as Exchange," *American Journal of Sociology*. 63(May), p597-606.
- Homans, G.C. (1964) *Social behavior: Its elementary forms*. New York: Harcourt Brace Jovanovic, Inc.
- Honig, B, & Davidsson, P. (2000) Nascent Entrepreneurship, Social Networks and Organizational Learning. Paper presented at the Competence 2000, Helsinki, Finland.
- Hudson, R.L. & McArthur, A. (1994) Contracting strategies in entrepreneurial and established firms. *Entrepreneurship Theory and Practice*, 18(4), p.43-59.
- Hwang K.K. (1987) Face and Favor: The Chinese Power Game. *The American Journal of Sociology*, Vol. 92. No.4, p.944-974.
- Ibarra, H. (1999) Provisional Selves: Experimenting with Image and Identity in Professional Adaptation. *Administrative Science Quarterly* 44(4): 764-791.
- Ireland, R.D Webb, J.W & Coombs, J.E. (2005) "Theory and Methodology in Entrepreneurship Research", David J. Ketchen, Donald D. Bergh, in (ed.) *Research Methodology in Strategy and Management (Research Methodology in Strategy and Management, Volume 2)*, Emerald Group Publishing Limited, p.111-141
- Ireland, R.D., Reutzel, C.R., & Webb, J.W. (2005) Entrepreneurship research at AMJ: What has been published, and what might the future hold? *Academy of Management Journal*. 48, p.556-564.
- Isabella, L.A. (1990) Evolving interpretations as change unfolds: How managers construe key organisational events. *Academy of Management Journal*, 33(1).
- Jack, S.L., & Anderson, A.R. (1999) Entrepreneurship education within the enterprise culture. Producing reflective practitioners, *International Journal of Entrepreneurship Behaviour & Research*, 5 (3): 110-125.

- Jaffe, D.T. (1988) Consulting to the family in business. In C. E. Aronoff & J. L. Ward (Eds.), *Family business sourcebook I*. Detroit, MI: Omnigraphics.
- Jarillo, C. J. (1989) Entrepreneurship and growth: the strategic use of external sources, *Journal of Business Venturing*, 4: 133-147.
- Jensen T.B, Kjærgaard A. & Svejvig P. (2008) Two Perspectives on Information System Adaptation: Using Institutional Theory with Sensemaking. Working Papers Informatics Research Group.
- Jeong, H.S. & Brower, R.S. (2008) Extending the present understanding of organizational sensemaking : Three stages and three contexts. *Administration and Society*, 40:223.
- Johannisson, B. (1995) Paradigms and entrepreneurial networks - some methodological challenges. *Entrepreneurship and Regional Development*, 7, 215-231.
- Johanson, J., & Mattsson, L.G. (1992) "Network Positions and Strategic Action: An Analytical Framework," in *Industrial Networks: A New View of Reality*. Eds. B. Axelsson and G. Easton. New York: Routledge, p.205-217.
- Johannisson B. (1998) Personal networks in emerging knowledge-based firms: spatial and functional patterns, *Entrepreneurship & Regional Development: An International Journal*, 10:4, p.297-312.
- Johnson, P. (1986) *New firms: An economic perspective*. London: Allen & Unwin.
- Johnson, P., Buehring, A., Cassel, C. & Symon, G. (2006) Evaluating qualitative management research: Towards a contingent criteriology. *International Journal of Management Reviews*, Vol. 8, Issue 3, p.131-156.
- Jones, G.K., Lanctot, J.R.A & Teegen, H.J. (2001) Determinants and Performance Impacts of External Technology Acquisition. *Journal of Business Venturing*, 16:255-283.
- Jolivet, E., Lanciano-Morandat, C., Nohara, H., & Pardo, D. (2009) Biopharmaceutical entrepreneurship in two Japanese and French bioclusters: Differences in founder profiles and experience, *Asian Business & Management*, Vol. 8, 4, p.429-460.
- Kaiser, R. and Prange. H. (2004) The Reconfiguration of National Innovation Systems-The Example of German Biotechnology. *Research Policy*. 33: 395-408.
- Kaish, S. & Gilad, B. (1991) Characteristics of opportunities search of entrepreneurs versus executives: sources, interests, general alertness. *Journal of Business Venturing*. 6, p.45-61.
- Karreman, D. and Alvesson, M. (2001) "Making Newsmakers: Conversational Identity at Work". *Organization Studies* 22(1): 59.

- Katz, J. (2003) A Guide to Getting Published., <http://www.slu.edu/x17970.xml> (accessed 18 March 2011).
- Katz, J. (2008) Fully mature but not fully legitimate: A different perspective on the state of entrepreneurship education. *Journal of Small Business Management*, 46(4): 550-566.
- Keisler, S., Sproull, L., (1982) Managerial responses to changing environments: perspectives on problem sensing from social cognition. *Administrative Science Quarterly*. 27(4), p.548-570.
- Kelly, D. & Amburgey, T. (1991) Organizational inertia and momentum: A Dynamic Model of Strategic Change. *Academy of Management Journal*, 34(3): 591-612
- Kennedy, M.M. (1976) Generalising from single case studies. *Evaluation Quarterly*, 3, p.661-678
- Khilstrom R.E. & Lafont, J.J. (1979) A general equilibrium entrepreneurial theory of firm formation based on risk aversion. *Journal of Political Economy* 87, p.719-748.
- King, N. (1994) 'The qualitative research interview', in C Cassell and G Symon (eds.), *Qualitative Methods in Organizational Research: A Practical Guide*, Sage, London.
- Kirchhoff, B. (1994) *Entrepreneurship and dynamic capitalism. The economics of business. Firm formation and growth*. Westport, CT: Praeger Publishers.
- Kirzner, I. M. (1979) *Perception, Opportunity, and Profit: Studies in the Theory of Entrepreneurship*. Chicago, IL: University of Chicago Press.
- Kirzner, I. (1973) *Competition and Entrepreneurship*. Chicago, IL and London: University of Chicago Press.
- Kirzner, I. (1999) 'Creativity and/or alertness: a reconsideration of the Schumpeterian entrepreneur'. *Review of Austrian Economics*. 11, p.5-17.
- Kirzner, I. (2009) 'The alert and creative entrepreneur: a clarification'. *Small Business Economics*. 32, p.145-52.
- Kirzner, I.M. (1981) *Competition and Entrepreneurship*. University Chicago Press, Chicago.
- Kirzner, I.M. (1997) Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35(1), p.60-85.
- Klein, P.G. (2008) Opportunity discovery, entrepreneurial action, and economic organization. *Strategic Entrepreneurship Journal*, 2(3), p.175-190.
- Klepper, S, & Sleeper, S. (2001) *Entry by spinoffs: Working Paper*. Carnegie Mellon University.

- Klevorick, A.K., Levin, R.C, Nelson, R.R & Winter, S.G. (1995) On the sources and significance of inter-industry differences in technological opportunities. *Research Policy* 24, p.185-205.
- Kodama, F. (1995) *Emerging Patterns of Innovation*. Boston: Harvard Business School Press
- Koehn, D. (1996) Should we trust in trust? *American Business Law Journal*. 34(2), p.183-203.
- Kontinen, T. & Ojala, A. (2011) International Opportunity Recognition among Small and Medium Sized Family Firms *Journal of Small Business Management*. 49(3), p.490-514.
- Korten, D. (2009) *Agenda for a New Economy: From Phantom Wealth to Real Wealth*, Berrett-Koehler Publishers, Inc.
- Koster S. (2006) *Who's child? How existing firms foster new firm formation: Individual startups, spinouts and spin-offs*. PhD Dissertation, Rijksuniversiteit Gronigen.
- Kostova, T., Roth, K. & Dacin, T. (2008) Institutional theory in the study of MNCs: A critique and new directions. *Academy of Management Review*, 33 (4): 994-1007.
- Krackhardt, D. (1990). *Assessing the Political Landscape: Structure, Cognition, and Power in Organizations*. *Administrative Science Quarterly*, 35:342-369.
- Kreiner, G. E. & Hollensbe, E.C (2006) "On the edge of identity: Boundary dynamics at the interface of individual and organizational identities." *Human Relations* 59(10): 1315-1341.
- Kroloff, G. (1988) At home and abroad: Weighing in, *Public Relations Journal*. October, 8.
- Krueger, N.F. (2000) The cognitive infrastructure of opportunity emergence. *Entrepreneurship Theory and Practice*. 24 (3), p.5-23.
- Krueger, N.F. (2003) The cognitive psychology of entrepreneurship. In: Acs, Z.J., Audretsch, D.B. (Eds.), *Handbook of Entrepreneurship Research*. Springer, USA.
- Kumar, R. (2005) *Research Methodology-A Step-by-Step Guide for Beginners*, (2nd.ed.), Singapore, Pearson Education.
- Kuhlman, G.A. (1996) Alliances for the future: cultivating a cooperative environment for biotech success. *Berkeley Technol. Law J.* 11 (2), p.311-362.
- Kuhn, T. (2006) "A Demented Work Ethic and a Lifestyle Firm: Discourse, Identity, and Workplace Time Commitments." *Organization Studies* 27(9): 1339-1358.

- Kuratko, D.F. (2009) *Entrepreneurship: Theory, Process, Practice (8th Edition)*, Cengage / Southwestern Publishers.
- Kuratko, D.F., & Hodgetts, R.M. (2001) *Entrepreneurship: A contemporary approach (5th Ed.)* Mason, OH: South-Western.
- Kvale, S. (1996) *Interviews: An Introduction to qualitative research interviewing*. Thousands Oaks, California: SAGE Publications.
- Kvale, S. (1995) The social construction of validity. *Qualitative Inquiry*, 1(1), p.19-40.
- Larson, A. (1992) Network dyads in entrepreneurial setting: A study of the governance of exchange relationships. *Administrative Science Quarterly*, 37, 76-104.
- Laursen, K., Masciarelli, F. & Reichstein, T. (2010). "A Matter of Location: The Role of Regional Social Capital in Overcoming the Liability of Newness in R&D Acquisition Activities," DRUID Working Papers 10-25, DRUID, Copenhagen Business School, Department of Industrial Economics and Strategy/Aalborg University, Department of Business Studies.
- Lavoie, D. (1991) The discovery and interpretation of profit opportunities: culture and the Kirznerian entrepreneur, in Berger, B. (ed.), *The Culture of Entrepreneurship*, (San Francisco, CA: ICS Press), p.33-51.
- Lee, L., Wong, P.K., Foo, M.D., & Leung, A. (2011) Entrepreneurial intentions: The influence of organizational and individual factors. *Journal of Business Venturing* 26, p.124-136.
- Leedy, P.D. & Ormrod, J.E. (2005) *Practical research: Planning and design* (8th ed.). Upper Saddle River, NJ: Prentice Hall.
- Leedy, P.D. (1997) *Practical research: planning and design* (6th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Lechner, C. & Dowling, M. (2003) Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms, *Entrepreneurship & Regional Development: An International Journal*, 15:1, p.1-26.
- Lehrer, M. & Asakawa, K. (2004) Rethinking the public sector: Idiosyncrasies of biotechnology commercialisation as motors of national R&D reform in Germany and Japan, *Research Policy* 33(6–7): 921-938.
- Levinthal, D.A. (1997) 'Adaptation on Rugged Landscapes', *Management Science*, 43(7), p.934-950.
- Lewis, D., Weigert, A. (1985) Trust as a social reality. *Social Forces*. 63 (4), p.967-985.
- Li, Wenli (2002) *Entrepreneurship and Government Subsidies: A General Equilibrium Analysis*, *Journal of Economic Dynamics and Control*. 26(11), p.1815-1844.

- Lichtenstein, B.B., Dooley, K.J., & Lumpkin, G.T. (2006) Measuring emergence in the dynamics of new venture creation. *Journal of Business Venturing*, 21, p.153-175.
- Limb, M. & Dwyer, C. (2001) *Qualitative Methodologies for Geographies: Issues and Debates*. London: Arnold.
- Lincoln, Y.S, & Guba, E.G. (1985) *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Liu, D., Chen, X. & Yao, X. (2011) From autonomy to creativity: a multilevel investigation of the mediating role of harmonious passion. *Journal of Applied Psychology*. 96, p.294-309.
- Lorenzoni, G. & Ornati, O. (1988) Constellations of firms and new ventures, *Journal of Business Venturing*, 3: 41-57.
- Lorrain, J, & Dussault, L. (1988) Relation between psychological characteristics, administrative behaviors, and success of founder entrepreneurs at the start up stage. In In B. A. Kirchoff, W.A. Long, W. ED. McMullan, K.H. Vesper & W.E. Wetzel (Eds.), *Frontiers of Entrepreneurship Research* pp. 150-164. Wellesley, Mass.: Babson College.
- Low, M.B. & MacMillan, I.C. (1988) Entrepreneurship: Past research and future challenges. *Journal of Management*. 14, p.139-161.
- Luhmann, N. (1979) *Trust and Power*. Wiley, Chichester, UK.
- Lynskey, M.J. (2006) Transformative technology and institutional transformation: Coevolution of biotechnology venture firms and the institutional framework in Japan. *Research Policy* (35), p.1389-1422.
- Mair, J. & Marti, I. (2006) Social Entrepreneurship Research: A Source of Explanation, Prediction and Delight, *Journal of World Business*, 41: 36-44.
- Maitlis, S. (2005) The social processes of organizational sensemaking. *Academy of Management Journal*, 48(1): 21-49.
- Malaysia Biotechnology Corporation (MBC) (n.d.). (2008) Retrieved April 12, 2009 from <http://www.biotechcorp.com.my/>
- Malaysia Biotechnology Corporation (MBC) (n.d.). (2009) Retrieved June 8, 2010 from <http://www.biotechcorp.com.my/>
- Malaysia Biotechnology Corporation (MBC) (n.d.). (2010) Retrieved April 10, 2011 from <http://www.biotechcorp.com.my/>
- Malaysia Biotechnology Corporation (MBC) Report (2007-2008) Retrieved June 15, 2009 from <http://www.biotechcorp.com.my/>
- Malaysia Biotechnology Corporation (MBC) Report (2009-2010) Retrieved June 8, 2011 from <http://www.biotechcorp.com.my/>

- Markman, G.D., Balkin, D.B. & Baron, R.A., (2002) Inventors and new venture formation: the effects of general self-efficacy and regretful thinking. *Entrepreneurship Theory and Practice*, p.149-165 ((Winter)).
- Markman, G.D. & Baron, R.A. (2003) Person-entrepreneurship fit: Why some people are more successful as entrepreneurs than others. *Human Resource Management Review*, 13(2), p.281-301.
- Mason, J. (1996) *Qualitative researching*. London, UK: SAGE Publications.
- Mayer, R.C., Davis, J.H. & Schoorman, F.D. (1995) An integrative model of organizational trust. *Academy of Management Review* 20 (3), p.709-734.
- McAuley, A. (1999) "Entrepreneurial Instant Exporters in the Scottish Arts and Crafts Sector," *Journal of International Marketing*. 7(4), p.67-82.
- McClelland, D.C. (1961) *The Achieving Society*. NY: Van Nostrand.
- McEnrue, M.P. (2011) Government Policies to Enhance Entrepreneurial Activity among Scientists in Kenya. Global Entrepreneurship Conference in Washington, D.C., USA.
- McEvily, B., Perrone, V. & Zaheer, A. (2003). Trust as an organizing principle. *Organization Science*, 14:91-103.
- McMullen, J.S. and Shepherd, D.A. (2006) 'Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur'. *Academy of Management Review*. 31, p.132-52.
- McQuaid, J., Smith-Doerr, L., & Monti Jr., D.J. (2010) Expanding Entrepreneurship: Female and Foreign-Born Founders of New England Biotechnology Firms, *American Behavioral Scientist* 53(7), p.1045-1063.
- McKelvey, B. (1999) Toward a campbellian realist organization science. In J. Baum, & B. McKelvey (Eds.), *Variations in Organization Science: In Honor of Donald T. Campbell*, Thousand Oaks, CA: Sage, p.383-411.
- McKelvey, B. (2004) Toward a complexity science of entrepreneurship. *Journal of Business Venturing*, 19: 313-341.
- McMillan, J., & Woodruff, C. (2002) The central role of entrepreneurs in transition economies. *Journal of Economic Perspectives* 16, p.153-70.
- McMullen, J.S. & Shepherd, D.A. (2006) Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1), p.132-152.
- McMullen, J., Plummer, L., & Acs, Z. (2007) What is an entrepreneurial opportunity? *Small Business Economics*. 28(4): 273-283.
- McMullen, J.S. & Shepherd, D.A. (2006) Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31, p.132-152.

- Mead, G. (1934) *Mind, self & society from the standpoint of a social behaviourist*, Chicago: University of Chicago Press.
- Meyer, K., & Skak, A. (2002) "Networks, Serendipity and SME Entry into Eastern Europe," *European Management Journal*. 20(2), p.179-188.
- Menger, C. (1950) *Principles of economics*. The Free Press: Glencoe, Illinois.
- Mills, G. (2003) *Action research: A guide for the teacher researcher* (2nd ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.
- Minichiello, V., Aroni, R., Timewell, E., & Alexander, L. (1990) *In-depth interviewing: Researching people*. Hong Kong: Longman Cheshire.
- Minniti, M., Bygrave, W., & Autio, E. (2006) *2005 Global entrepreneurship monitor report*. London; Babson Park, MA: London Business School and Babson College.
- Minniti, M. (2008) The Role of Government Policy on Entrepreneurial Activity: Productive, Unproductive, or Destructive? *Entrepreneurship Theory & Practice*, p.779-790.
- Mises, L. (1949) *Human action: A treatise in economics*. Chicago: Henry Regnery Company.
- Misztal, B.A. (1996) *Trust in Modern Societies: The Search for the Bases of Social Order*. Polity Press, New York.
- Mitchell, R., Busenitz, L., Lant, T., McDougall, P., Morse, E., & Smith, B. (2004) The distinctive and inclusive domain of entrepreneurial cognition research. *Entrepreneurship Theory and Practice*. 28: 505-518.
- Mitchell, R.K., Busenitz, L.W., Lant, T., McDougall, P.P., Morse, E.A. & Smith, J.B. (2007) The central question in entrepreneurial cognition research 2007. *Entrepreneurship Theory and Practice*. 31(1), p.1-27.
- Mittiness, C., Sudek, R. & Cardon, M.S. (2012) Investor characteristics that determine whether perceived passion leads to higher evaluations of funding potential. *Journal of Business Venturing*. 27, p.592-606.
- Mohd. Rosli Mohamad (2000) *Industri Kecil dan Sederhana: Landasan Pembangunan Usahawan*. Kuala Lumpur: Penerbit Universiti Malaya.
- Moroz, P.W. & Hindle, K. (2012) Entrepreneurship as a Process: Toward Harmonizing Multiple Perspectives. *Entrepreneurship Theory & Practice*. DOI:10.1111/j.1540-6520.2011.00452.x.
- Mosco, V. & McKercher, C. (2007) "Introduction: Theorizing knowledge labor and the information society". *Knowledge Workers in the information society*. p.vii-xxiv.
- MOSTI (2005) *Biotechnology for wealth creation and social well-being*. Putrajaya: The Ministry of Science, Technology and Innovation (MOSTI).

- MOSTI (2008) Malaysian Biotechnology Report. Putrajaya: the Ministry of Science, Technology and Innovation (MOSTI).
- Muller, C., Fujiwara, T., & Herstatt, C. (2004) Sources of Bioentrepreneurship: The Cases of Germany and Japan. *Journal of Small Business Management* 42(1), p.93-101.
- Mueller, P. (2007) Exploiting entrepreneurial opportunities: The impact of entrepreneurship on growth. *Small Business Economics*, Vol. 28 Number 4, p.355-362.
- Murray, T. (2011) *The Transformational Entrepreneur: Engaging The Mind, Heart, & Spirit For Breakthrough Business Success*. Performance Transformation, LLC.
- Murphy P.J (2011) A 2x2 Conceptual Foundation for Entrepreneurial Discovery Theory. *Entrepreneurship Theory & Practice*. DOI: 10.1111/j.1540-6520.2010.00368.x
- Nguyen, T.V. & Rose, J. (2009) Building trust-Evidence from Vietnamese entrepreneurs. *Journal of Business Venturing* (24), p.165-182.
- Neisser, U. (1967) *Cognitive psychology*. Appleton Century Crofts, New York.
- Newcomb, T.M., Ralph H.T., & Philip, E.C. (1952) *Social Psychology: The Study of Human Interaction*. London: Routledge and Kegan Paul Ltd.
- Nicholson, L. & Anderson, A.R. (2005) News and nuances of the entrepreneurial myth and metaphor: Linguistic games in entrepreneurial sense-making and sense-giving. *Entrepreneurship Theory and Practice*, p.153-172.
- Niehoff, B.P., Enz, C.A., Grover, R.A. (1990) The impact of top-management actions on employee attitudes and perceptions. *Group and Organization Studies* 15, p.337-352.
- Nielsen, S.L. & Lassen, A.H. (2012) Identity in entrepreneurship effectuation theory: a supplementary framework. *International Entrepreneurship Management Journal* (2012) 8:373-389 DOI 10.1007/s11365-011-0180-5.
- Ninth Malaysia Plan for 2006-2010 Report.
- Nohria, N. and Eccles, R. G. (1992) 'Face-to-face: Making Network Organisations Work', in N.Nohria and R. G. Eccles (eds) *Networks & Organisations Structure, Form & Action*, Harvard Business School Press, Cambridge, MA, p.288-307.
- Nonaka, I. & Takeuchi, H. (1995) *The knowledge-creating company*. New York: Oxford University Press.
- North, D.C. (1990) *Institutions, Institutional Change, and Economic Performance*, New York: Cambridge University Press.

- North, D.C. (2005) *Institutions and the Performance of Economies Over Time*. Dordrecht, Springer.
- NSF (1998) *Industry Trends in Research Support and Links to Public Research*. National Science Foundation Press, Arlington, VA.
- O'Connor, G.C. & Rice, M.P. (2000) 'Opportunity Recognition and Evaluation for Radical Innovations in Large Established Firms,' in *Research at the Marketing/Entrepreneurship Interface* (ed. Gerald Hills), Institute for Entrepreneurial Studies, University of Illinois at Chicago, p.49-71.
- Outcalt, C. (2000) The notion of entrepreneurship: Historical and emerging issues. CELCEE Digest no. 00- 4. Kansas City, MO: Kauffman Center for Entrepreneurial Leadership Clearinghouse on Entrepreneurship Education.
- OECD (1994) *Accessing and Expanding the Science and Technology Base, DSTI/STP/TIP*. Paris: OECD.
- OECD (2006) *OECD Biotechnology Statistics*. OECD, Paris.
- Ojala, A. (2009) "Internationalization of Knowledge-Intensive SMEs: The Role of Network Relationships in the Entry to a Psychically Distant Market," *International Business Review*. 18(1), p.50-59.
- Olson, Mancur, Jr. (1996) Big bills left on the sidewalk: Why some nations are rich, and others poor. *Journal of Economic Perspectives* 10(2): 3-24.
- Oliver, A.L. (2004) Biotechnology entrepreneurial scientists and their collaborations. *Research Policy*, (33), p.583-597.
- Orlikowski, W.J. & Gash, D.C. (1994) Technological Frames: Making Sense of Information Technology in Organizations, *ACM Transactions on Information Systems* 12(2): 174-201.
- Ostgaard, T. A. & Birley, S. (1994) 'Personal networks and firm competitive strategy – A strategic or coincidental match?' *Journal of Business Venturing*, 9, p.281-305.
- Ozgen, E., and Baron, R.A. (2007) "Social Sources of Information in Opportunity Recognition: Effects of Mentors, Industry Networks, and Professional Forums," *Journal of Business Venturing*. 22(2), p.174-192.
- Palich, L. & Bagby, D.R. (1995) Using cognitive theory to explain entrepreneurial risk-taking: challenging conventional wisdom. *Journal of Business Venturing*. 10, p425-438. [http://dx.doi.org/10.1016/0883-9026\(95\)00082-J](http://dx.doi.org/10.1016/0883-9026(95)00082-J).
- Parker, L.D (2008) Interpreting interpretive accounting research. *Critical Perspectives on Accounting*, 19(6): 909–914
- Patton, M.Q. (1990) *Qualitative evaluation and research methods*. London: Sage.

- Peirce, C.S. (1940) *Philosophical writings of Peirce*. New York, NY: Dover.
- Peirce, C.S. (1966) *Selected writings of Peirce*. New York, NY: Dover.
- Peng, M.W. (2001) How entrepreneurs create wealth in transition economies. *Academy of Management FT Executive*, 15 (1): 95-108. [Special issue on "Entrepreneurship and Wealth Creation"]
- Penrose, E. (1959) *The theory of the growth of the firm*. Oxford: Oxford University Press.
- Perrow, C. (1992) 'Small Firm Networks', in N. Nohria and R. G. Eccles (eds) *Networks & Organisations Structure, Form & Action*, Harvard Business School Press, Cambridge, MA, Ch. 17.
- Perry J.T, Chandler G.N. & Markova, G. (2011) Entrepreneurial Effectuation: A Review and Suggestions for Future Research. *Entrepreneurship Theory and Practice*.
DOI: 10.1111/j.1540-6520.2010.00435.x.
- Perttula, K. (2010) Passion for work: initial measurement and construct validation. *Academy of Management Conference*. Chicago, IL.
- Petty, J.S. (2007) *Evaluating the Roles of Government Policies on Entrepreneurship*, University of Lausanne Switzerland, The Cornell-McGill Conference on Institutions and Entrepreneurship.
- Pfaff, W. (2002) Islam and the West: Incompatibility of values. *International Herald Tribune*, December 12. Retrieved October 6, 2003, from: www.commondreams.org/views02/1212-10.htm.
- Pisano, G. (2006) Can Science Be A Business? Lessons from Biotech. *Harvard Business Review*. October. P.1-12.
- Pitts, R.A. & Snow, C.C. (1986) *Strategies for competitive success*. New York: Wiley.
- Poland, B.D. (2003) Transcription quality. In J.A. Holstein & J.F. Gubrium (Eds.), *Inside Interviewing: New Lenses, new concerns* (p.267-288). Thousand Oaks, California: SAGE Publications.
- Portes, A. & Sensenbrenner, J. (1993). Embeddedness and Immigration: Notes on the Social Determinants of Economic Action. *American Journal of Sociology*, 98:1320-1350.
- Prasad, P. (1993) Symbolic Processes in the Implementation of Technological Change: A Symbolic Interactionist Study of Work Computerisation, *Academy of Management Journal*, 36 (6), p.1400-1429.
- Puhakka, V. (2011) Developing a creative-cognitive model of entrepreneurial alertness to business opportunity. *Journal of Management Strategy*, Vol. 2, No. 4.
- Putnam, R.D. (1995) Bowling alone: America's declining social capital. *Journal of Democracy*. 6(1), p.3-10.

- Quinn, R., & Cameron, K. (1983) Organizational life cycles and shifting criteria of effectiveness: Some preliminary evidence. *Management Science*, 29, p.33-41.
- Rae, D. (2000) Understanding entrepreneurial learning: A question of how? *International Journal of Entrepreneurial Behavior and Research*, 6(3), 145-159.
- Rae, D. & Carswell, M. (2000) 'Using a life-story approach in researching entrepreneurial learning: The development of a conceptual model and its implications in the design of learning experiences', *Education and Training*, 42(4/5), p.220-227.
- Rae, D. (2007) *Entrepreneurship from opportunity to action*. Palgrave Macmillan.
- Rajen, M. (2006) CEO's Laptop: The colours of biotechnology. The Edge Malaysia,1.
- Read, S., Sarasvathy, S., Dew, N., Wultbank, R., & Ohlsson, A.V. (2011) *Effectual Entrepreneurship*. Routledge: London and New York.
- Reason, P., & Bradbury, H. (Eds.). (2001b) *Handbook of action research: Participative inquiry and practice*. London: Sage
- Redding, S.G. (1980) Cognition as an aspect of culture and its relation to management processes: An exploratory review of the Chinese case. *Journal of Management Studies*, 17(2): 127-148.
- Redding, S.G. (1990) *The spirit of the Chinese capitalism*. De Gruyter, New York.
- Reid, S.D. (1984) "Information Acquisition and Export Entry Decisions in Small Firms," *Journal of Business Research*. 12(2), p.141-157.
- Reinhardt, W., Schmidt, B., Sloep, P., & Drachsler, H. (2011) Knowledge worker roles and actions – results of two empirical studies. *Knowledge and Process Management*, 18.3, 150-174. doi:10.1002/kpm.378, <http://onlinelibrary.wiley.com/doi/10.1002/kpm.378/abstract>
- Resnick, L., Levine, J., & Teasley, S. (1991) *Perspectives on socially shared cognition*. Washington, DC: American Psychological Association.
- Reynolds, P.D. (1997) Who starts new firms? Preliminary explorations of firms in gestation. *Small Business Economics*. 9(5), p.449-462.
- Reynolds, P.D. & White, S.B. (1997) *The entrepreneurial process: Economic growth, men, women, and minorities*. Westport, CT: Quorum Books.
- Roberts, E.B., & Hauptmann, O. (1986) The process of technology transfer to the newbiomedical and pharmaceutical firm. *Research Policy* 15 (3), p.107-119.

- Rogers, A. & Viles, H.A. (2003) *The student's companion to geography*. 2nd edition. Oxford; Blackwell.
- Romanelli, E., & Schoonhoven, K. (2001) The local origins of new firms. In: Schoonhoven, K., Romanelli, E. (Eds.), *The entrepreneurial dynamic*. Stanford, Stanford University Press, p.40-67.
- Ronstadt, R. (1988) The corridor principle. *Journal of Business Venturing*, 3(1), p.31-40.
- Rothaermel, F.T. & Deeds, D.L. (2004) Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic Management Journal*, 25 (3): 201-221.
- Rubin, H.J. & Rubin, I.S. (2005) *Qualitative interviewing: The art of hearing data* (2nd ed.). Thousand Oaks, California: SAGE Publications.
- Salancick, G. & Pfeffer, J. (1978) A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 23: 224-253.
- Sainsbury, L., (2002) Strong government support for UK biotech. *Biotechnology Investors' Forum Worldwide*, 2, p.20-22.
- Samuelsson, M., & Davidsson, P. (2009) Does venture opportunity variation matter? Investigating systematic process differences between innovative and imitative new ventures. *Small Business Economics*. 33(2): 229-255.
- Sampath P.G., & Oyelaran-Oyeyinka, B. (2010) Rough Road to The Market: Constrained Biotechnology Innovation in Nigeria and Ghana, *Journal of International Development* 22, p.962-977.
- Sanz-Velasco, S.A. (2006) Opportunity development as a learning process for entrepreneurs. *International Journal of Entrepreneurial Behaviour & Research*. 12(5) p.251-271.
- Sarason, Y., Dean, T. & Dillard, J.F. (2005) Entrepreneurship as the nexus of individual and opportunity: a structuration view. *Journal of Business Venturing*. 21, p.286-305.
- Sarasvathy, S.D. (2001) Causation and effectuation: Towards a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*. 26(2), p.243-288.
- Sarasvathy, S.D. (2008) *Effectuation: Elements of entrepreneurial expertise. New horizons in entrepreneurship research*. Cheltenham, U.K: Edward Elgar Publishing.
- Sarasvathy, S.D., Dew, N., Velamuri, R.S., & Venkataraman, S. (2003) Three views of entrepreneurial opportunity. In Z. Acs & D. Audretsch (Eds.), *Handbook of entrepreneurial research* (p.141-160). Dordrecht: Kluwer.

- Sarasvathy, S.D., Simon, H.A, and Lave, L.B. (1998) *Perceiving and managing business risks:Differences between entrepreneurs and bankers*, Journal of Economic Behavior and Organization. 33(2): 207-226.
- Seale, C. (1999) *The Quality of Qualitative Research*. London: Sage.
- Seymour, J., & Ingleton, C. (1999) Ethical issues in qualitative research at the end of life. *International Journal of Palliative Nursing*, 5(2), p.65-73.
- Schade, C. & Burmeister, K. (2008) Experiments on entrepreneurial decision-making: a different lens through which to look at entrepreneurship. Mimeo.
- Schere, J. (1982) Tolerance of ambiguity as a discriminating variable between entrepreneurs and managers. *Proceedings of the Academy of Management*, 42, p.404-408.
- Schein, E. H. (1985) *Organizational culture and leadership: A dynamic view*. San Francisco, CA: Jossey-Bass
- Schumpeter, J. (1934) *The Theory of Economic Development*. Harvard University Press, Boston, Mass.
- Schumpeter, J. (1946) "Capitalism", in *Encyclopaedia Britannica*, Vol. IV, p. 801-807, reprinted in Schumpeter, J. (1989) *Essays on Entrepreneurs, Innovations, Business Cycles and the Evolution of Capitalism*, edited by Richard V. Clemence, New Brunswick, N.J.: Transaction Publishers, p.189-210.
- Schumpeter, J.A. (1911) *Theorie der wirtschaftlichen Entwicklung*. Leipzig, Germany:Duncker and Humblot.
- Schwab, K & Porter, E. (2008) The Global Competitiveness Report 2008-2009. World Economic Forum.
- Schwarz, N., Clore, G.L. (2007) Feelings and phenomenal experiences, In: Higgins, E.T., Kruglanski, A. (Eds.), *Social Psychology: Handbook of Basic Principles*, 2nd ed. Guildord Press, New York, p.385-407.
- Schwitzgebel, E. (2006) "Belief", in Zalta, Edward, *The Stanford Encyclopedia of Philosophy*, Stanford, CA: The Metaphysics Research Lab, retrieved 2008-09-19.
- Scott, W.R. (1995) *Institutions and Organizations*. Thousand Oaks, CA: Sage Publications.
- Sorenko, A., & Stach, A. (2009) The impact of expectation disconfirmation on customer loyalty and recommendation behaviour: Investigating online travel and tourism services. *Journal of Information Technology Management*, 3.
- Shackle, G.L.S. (1955) *Uncertainty in economics and other reflections*. Cambridge: Cambridge University Press.

- Shah, S.K. and Tripsas, M. (2007) 'The accidental entrepreneur: the emergent and collective process of user entrepreneurship'. *Strategic Entrepreneurship Journal*. 1, p.123-40.
- Shane, S. (2012) Reflections on The 2010 AMR Decade Award: Delivering on The Promise of Entrepreneurship As a Field of Research. *Academy of Management Review*. 2012, Vol. 37, No. 1, 10–20.<http://dx.doi.org/10.5465/amr.2011.0078>.
- Shane, S. (1996) Explaining Variations in Rates of Entrepreneurship in The United States: 1899-1988. *Journal of Management*, 22, p.747-781.
- Shane, S. (2000) Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4), p.448-469.
- Shane, S. & Khurana, R., (2000) Career experience and firm founding. *Academy of Management Best Paper Proceedings*.
- Shane, S. & Venkataraman, S. (2000) The promise of entrepreneurship as a field of Research. *Academy of Management Review*, 25(1), p.217-226.
- Shane, S. (2001a) Technological Opportunities and New Firm Creation, *Management Science*, 47(2), 205-20.
- Shane, S. (2003) *A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar, Cheltenham, UK.
- Shane, S. (2009) Why encouraging more people to become entrepreneurs is bad public policy. *Small Business Economics*. 33:141-149.
- Shane, S. and Eckhardt, J. (2003) "The individual-opportunity nexus", in Acs, Z. and Audretsch, D. (Eds), *Handbook of Entrepreneurship Research*, Kluwer, Dordrecht, p.161-91.
- Shane, S. & Cable, D. (2002). Network Ties, Reputation, and the Financing of New Ventures. *Management Science*, 48:364-381.
- Shapiro, A. (1975) The displaced, uncomfortable entrepreneur. *Psychology Today*, p.83-88.
- Shapiro, S.P. (1987) The social control of impersonal trust. *American Journal of Sociology*. 93 (3), p.623-658.
- Shaw, R. (1997) *Trust in the Balance: Building Successful Organisations on Results, Integrity and Concern*, Jossey-Bass, California.
- Shepherd, D.A., Douglas, E.J., & Shanley, M. (2000) New venture survival: Ignorance, external shocks, and risk reduction strategies. *Journal of Business Venturing*, 15(5/6), 393–410.
- Sherman, A.L. (1997) *The soul of development: Biblical Christianity and economic transformation in Guatemala*. New York: Oxford University Press.

- Shinde, J.S., & Shinde U.S. (2011) The Perennial Perspective on Entrepreneurship. *Journal of Strategic Innovation and Sustainability* vol. 7(1).
- Silversides, G. (2000) Networking and identity: The role of networking in the public image of professional service firms. *Journal of Small Business and Enterprise Development*. 8(2).
- Simon, F & Kotler, P. (2003) *Building Global Biobrand: Taking Biotechnology into Market*. Free Press
- Singh, R.P. (2000) *Entrepreneurial Opportunity Recognition through Social Networks*. New York: Garland Publishing.
- Singh, R., Hills, G., Hybels, R. & Lumpkin, G. (1999) Opportunity recognition through social network characteristics of entrepreneurs. In: Reynolds, P., Bygrave, W., S.Manigart, C., Mason, G., Meyer, H., Sapienza, K. (Eds.), *Frontiers of Entrepreneurship Research*. Babson College Press, Babson, Park, p. 228-241.
- Sloane, P. (1999) *Islam, modernity and entrepreneurship among the Malays*. London: MacMillan Press.
- Smallbone, D., Leigh, R. & North, D. (1995) 'The characteristics and strategies of high growth SMEs', *International Journal of Entrepreneurial Behaviour and Research*. 1(3), p.44-62.
- Smilor, R.W. (1997) Entrepreneurship: Reflections on a subversive activity. *Journal of Business Venturing*. 12: 341-346.
- Smilor, R. W. (1997) Entrepreneurship: Reflections on a subversive activity. *Journal of Business Venturing*, 12: 341-346.
- Smith, H. (1987) Is There a Perennial Philosophy, *Journal of the American Academy of Religion*. 55:3.
- Smith, J.K. (1992) Interpretive inquiry: A practical and moral activity. *Entrepreneurship Theory and Practice*, 31(2).
- Smeltzer, S (2008) Biotechnology, the Environment, and Alternative Media in Malaysia, *Canadian Journal of Communication*, 33, 5-20.
- Snow, D. A. and L. Anderson (1987). "Identity Work Among the Homeless: The Verbal Construction and Avowal of Personal Identities." *The American Journal of Sociology* 92(6): 1336-1371.
- Sobrero, R. & Roberts, E. (2001). The Trade-off between Efficiency and Learning in Interorganizational Relationships for Product Development. *Management Science*, 47:493-511.
- Soh, P. (2003) The role of networking alliances in information acquisition and its implications for new product performance. *Journal of Business Venturing*. 18: 727-744.

- Sørensen, P. B. (2007) Can capital income taxes survive? And should they? *CESifo Economic Studies*, 53,p.1–57.
- Stach, A. & Serenko, A. (2010) The Impact of Expectation Disconfirmation on Customer Loyalty and Recommendation Behavior: Investigating Online Travel and Tourism Services. *Journal of Information Technology Management*, XX (3), p.26-41
- Stafford, K., Duncan, K. A., Dane, S., & Winter, M. (1999) A research model of sustainable family businesses. *Family Business Review*, 12(3), p.197-208.
- Stake, R. (1978) *The case study method in social inquiry*. *Educational researcher*, 7(2), p.5-8.
- Starr, J.A. & Bygrave, W.D. (1992) The second time around: The outcomes, assets, and liabilities of prior start-up experience. In S. Birley & I.C. MacMillan (Eds), *International perspectives on entrepreneurship research 1991: Proceedings of the first annual global conference on entrepreneurship research* (p. 340–363). Amsterdam, The Netherlands: North Holland.
- Steyaert, C. (1997) A qualitative methodology for process studies of entrepreneurship: creating local knowledge through stories, *International Studies of Management and Organization*, 27: 13-33.
- Steyaert, C. (2007) “Entrepreneurship” as a conceptual attractor? A review of process theories in 20 years of entrepreneurship studies. *Entrepreneurship and Regional Development*. 19(6), p.453.
- Stevenson, L & Lundstrom, A. (2001) “Entrepreneurship policy for the future”, Swedish Foundation for Small Business Research, Stockholm, <http://www.fsf.se/publikation/pdf/Stevens-Lunds.doc.pdf>.
- Stinchcombe, A.L. (1965) Organizations and Social Structure. In: March J editor editors. *Handbook of Organizations*. Chicago: Rand McNally, p.153-193.
- Stokes, D. (2000) Putting Entrepreneurship into Marketing: The Processes of Entrepreneurial Marketing: 1-16, *Journal of Research in Marketing & Entrepreneurship*. 2(1): Spring.
- Storey, D.J. (1994) *Understanding the small business sector*, London: International Thomson Business Press.
- Storey, D.J. (2000) Six steps to heaven: Evaluating the impact of public policies to support small businesses in developed economies. In *Handbook of entrepreneurship*, ed. D.L. Sexton and H. Lundstrom, p.176–92. Malden, MA: Blackwell.
- Storey, D.J. (2003) Entrepreneurship, small and medium sized enterprises and public policy. In Z.J. Acs & D.B. Audretsch (Eds.), *International Handbook of Entrepreneurship Research* (p. 473-513). Dordrecht: Kluwer Academic.

- Stuart, T. & Sorenson, O. (2003). The geography of opportunity: spatial heterogeneity in founding rates and the performance of biotechnology firms. *Research Policy*, 32:229-253.
- Strauss, A. (1978) *Negotiations: Varieties, contexts, processes and social order*. San Francisco, CA: Jossey Bass.
- Strauss, A. (1987) *Qualitative analysis for social scientists*. Cambridge University Press.
- Stevenson, H.H., & Jarillo, J.C. (1990) A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11, p.17-27.
- Sudek, R. (2006) Angel investment criteria. *Journal of Small Business Strategy*. 17, p.89-103.
- Sundararajan, M. & Peters, L. (2007) Role of emotions in the entrepreneur's opportunity recognition process. Paper Presented at the Academy of Management Conference. Philadelphia, PA.
- Surie, G. & Ashley, A., (2008) Integrating pragmatism and ethics in entrepreneurial leadership for sustainable value creation. *Journal of Business Ethics* 81, p.235-246.
- Su Y.S. & Hung, L.C. (2009) Spontaneous vs. Policy-Driven: The Origin and Evolution of the Biotechnology Cluster. *Technological Forecasting & Social Change*, 76(5), p.608-619 (SSCI)
- Sutherland, J. W. (1975) *Systems: Analysis, Administration, and Architecture*. New York: Van Norstrand.
- Sveningsson, S. and Alvesson, M. (2003) "Managing Managerial Identities: Organizational Fragmentation, Discourse and Identity Struggle." *Human Relations* 56(10): 1163-1193.
- Swedberg, T. (2000) *Entrepreneurship: The social science view*. New York: Oxford University Press.
- Sweeney, G. P. (1987) *Innovation, Entrepreneurship and Regional Development* (New York: St. Martin's Press).
- Taylor, S. & Bogdan, R. (1998) "Introduction to Qualitative Research Methods: A Guidebook and Resource." 3rd ed, John Wiley & Sons, New York.
- Thayer, A. (1997) Universities join economic growth. *Chem. Eng. News*, p. 21-24, (June 30).
- The Star Online Newspaper Malaysia (2009) Reasons to Leave, accessed at <http://thestar.com.my/news/story.asp?file=/2009/12/4/focus/5220846&ec=focus> on 4 December 2009.
- Thibault, J.W. & Harold H.K. (1959). *The Social Psychology of Groups*. New York: John Wiley & Sons, Inc.

- Thomson, C.J., Locander, W.B. & Pollio, H.R. (1989) 'Putting Consumer Experience back into Consumer Research: The Philosophy and Method of Existential Phenomenology', *Journal of Consumer Research* 16(2): 33-146.
- Thornhill, S & Amit, R. (2003) Learning about failure: Bankruptcy, firm age, and the resource-based view. *Organization Science*, 4:497–509.
- Thurlow, A. & Mills, J.H. (2009) Change, talk and sensemaking. *Journal of Organizational Change Management*, 22(5), p.459-479.
- Timmons, J. A., & Bygrave, W. D. (1986) Venture capital's role in financing innovation for economic growth. *Journal of Business Venturing*, 1(2), p.161-176.
- Touraine, A. (2007) *A new paradigm for understanding today's world*. Cambridge Polity.
- Tsai, K.H. & Wang, J.C. (2008). External technology acquisition and firm performance: A longitudinal study. *Journal of Business Venturing*, 23:91-112.
- Tsoukas, H. (1989) The validity of idiographic research explanations. *Academy of Management Review*. 14(4): 551-561.
- Tucker, D. J., Singh, J.V. & Meinhard, A. G. (1990) Founding characteristics, imprinting and organizational change. In J. V. Singh (Ed.), *Organizational evolution: New directions* (p.182-200). Newbury Park, CA: Sage.
- Turel, O., Serenko, A., & Bontis, N. (2010) User acceptance of hedonic digital artifacts: A theory of consumption values perspective. *Information and Management* (47), p.53-59.
- Tze Kheong, J.C. (Sept-Oct, 2009). Multimedia Super Corridor Malaysia: Public-private R&D Collaboration. *Tech Monitor*.
- Ucbasaran, D., Westhead, P., & Wright, M. (2003) Business ownership experience, information search and opportunity identification: A research note. Paper presented at the Academy of Management Meeting in Seattle, WA.
- Ucbasaran, D., Westhead, P. & Wright, M. (2001) 'The focus of entrepreneurial research: contextual and process issues,' *Entrepreneurship: Theory and Practice*. 25(4), p.57-80.
- Vaghely I.P. & Julien P.A. (2010) Are opportunities recognized or constructed? An information perspective on entrepreneurial opportunity identification. *Journal of Business Venturing*. 25, p.73-86.
- Vallerand, R. J., Mageau, G. A., Ratelle, C., Leonard, M., Blanchard, C., Koestner, R., & Gagne, M. (2003) Les passions de l' ame: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85: 756-767.

- Valliere, D. (2011) Entrepreneurial Alertness Through Cognitive Schemata, 2nd International Conference on Business and Economic Research (2nd ICBER 2011) Proceeding.
- Van de Ven, A.H. (1993) The development of an infrastructure for entrepreneurship. *Journal of Business Venturing*, 8, p.211-230.
- Van de Ven, A.H. & Poole, M.S. (1989) Methods for studying innovative processes. In A.H. Van de Ven & M.S. Poole (Eds.), *Research on the management of innovation: The Minnesota studies* (pp. 31-54). New York: Ballinger/Harper & Row.
- Vesper, K.H. (1983) *Entrepreneurship and national policy*. Chicago, IL: Walter E. Heller International Corporation Institute for Small Business.
- Vesper, K.H. (1990) *New Venture Strategies*, 2nd edn (Englewood Cliffs, NJ: Prentice-Hall).
- Venkatraman, N., and Camillus, J.C. (1984) *Exploring the concept of "fit" in strategic Management*, *Academy of Management Review*. 9(3), p.513-525.
- Venkataraman, S. (1997) The distinctive domain of entrepreneurship research. In: Katz, J.A. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, vol. 3. JAI Press, Greenwich, CT, p.119-138.
- Venkataraman, S. & Van de Ven, A.H. (1998) Hostile environmental jolts, transaction set, and new business, *Journal of Business Venturing*, 13: 231–255.
- Venkataraman, S. (2003) Foreword. In *A General Theory of Entrepreneurship. The Individual-Opportunity Nexus*, Shane S (ed). Edward Elgar: Northampton, MA; xi–xii.
- Verheul, I, Wennekers, S., Audretsch D.B. & Thurik A.R. (2001) "An eclectic theory of entrepreneurship: policies, institutions and culture". DP TI 2001-030/3, Tinbergen Institute, <http://www.tinbergen.nl/discussionpapers/01030.pdf>.
- Von Hippel, E. (1994) "Sticky information and the locus of problem solving: implications for innovation", *Management Science*. 40(4), p.429-39.
- Wacker, J.G. (2004) A theory of formal conceptual definitions: Developing theory-building measurement instruments. *Journal of Operations Management*. 22, p.629-650.
- Wagner, J. & Sternberg, R. (2004) Start-up activities, individual characteristics, and the regional milieu: Lessons for entrepreneurship support policies from German micro data. *Annals of Regional Science*, 38, p.219-240.
- Weber, R.P. (1990) *Basic content analysis*. Newbury Park, CA: Sage Publications.

- Weber, P.S. & Manning, M.R. (2001) Cause Maps, Sensemaking, and Planned Organizational Change in *Journal of Applied Behavioral Science*. 37, p.227.
- Weber, K. & Glynn, M.A. (2006) Making sense with institutions: Context, thought and action in Karl Weick's theory. *Organization Studies*, 27(11), 1639.
- Weick, K.E. (1989) Theory construction as disciplined imagination. *Academy of Management Review*. 14, p.516-531.
- Weick, K.E. (1979) *The social psychology of organizing*. Reading, MA: Addison-Wesley.
- Weick, K.E. (1995) *Sensemaking in organizations*. Thousand Oaks, CA: Sage. p.61-62.
- Weick, K.E. (2001) *Making sense of the organization*, Oxford, UK: Blackwell, ISBN 0631223177.
- Weick, K.E. (2003) Enacting an environment: The infrastructure of organizing. Debating organization: Point-counterpoint in organization studies. In R. Westwood & S. R. Clegg (Eds.), *Debating organization: Point-counterpoint in organization studies* (pp. 184–194). Oxford: Blackwell Publishing.
- Weick, K.E. (2005) Managing the unexpected: Complexity as distributed sensemaking. *Uncertainty and Surprise In Complex Systems: Questions On Working With The Unexpected*, 51.
- Weick, K.E. (2006) Faith, evidence, and action: Better guesses in an unknowable world. *Organization Studies*, 27(11), 1723–1736.
- Welsch, H.P. & LaVan, H. (1981) Inter-relationships between organizational commitment and job characteristics, job satisfaction, professional behaviour, and organizational climate. *Human Relations* 24 (12), p.1079-1089.
- Whetten, D.A. (1989). What constitutes a theoretical contribution? *Academy of Management Review*. 14, p.490-495.
- Whitehead, A.N. (1929) *Process and reality*. New York: The Macmillan Co.
- Williams, M. (2002) Generalization in interpretive research. In T. May (Ed.), *Qualitative research in action* (p.125-143). London, UK: SAGE Publications.
- Willis, K. (2006) Analysing qualitative data. In M. Walter (ed.), *Social research methods: An Australian perspective* (p.257-280). Melbourne: Oxford University Press.
- Wincent, J., Cardon, M.S., Singh, J. & Drnovsek, M. (2008) Entrepreneurial affect: the distinction between emotion and passion. Academy of Management Conference. Anaheim, CA.

- Winstein, K.J. (2009, March 17). *Funding dries up for biotechnology start-ups*. The Wall Street Journal.
- Woolley, J.L., & Rottner, R.M. (2008) Innovation Policy and Nanotechnology Entrepreneurship. *Entrepreneurship Theory and Practice*, 32(5), p.791-811.
- World Bank (2011) Website accessed on 4 Nov. 2011, www.worldbank.org.
- Yin, R.K. (2003) *Case study research: Design and methods* (3rd ed., Vol. 5). Thousand Oaks, CA: Sage.
- Yin, R.K. (2009) *Case study research: Design and methods* (4th ed., Vol. 5). Thousand Oaks, CA: Sage.
- Yin, R.K. (1989) *Case study research: Design and methodology*, Sage Publications, Thousand Oaks, United Kingdom.
- Yli-Renko H., Autio, A. & Sapienza, H.J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal*, 22:587-613.
- Yuki, G.A. (1989) *Leadership in Organization* (2nd ed.). Prentice-Hall, Englewood Cliffs, NJ.
- Zahra, S.A. (1996a) Technology strategy and new venture performance: A study of corporate-sponsored and independent biotechnology ventures. *Journal of Business Venturing*, 11(4), p.289-321.
- Zahra, S.A., Jennings, D.F., & Kuratko, D.F. (1999) The antecedents and consequences of firm-level entrepreneurship: The state of the field. *Entrepreneurship Theory & Practice*. 23(3), p.45-65.
- Zahra, S.A. Ireland, R.D., and Hitt, M.A. (2000) International expansion by new venture firms: International diversity, mode of market entry, technological learning and performance. *Academy of Management Journal*, 43: 925-950.
- Zahra, S.A, Korri, J.S. & Yu, J. (2005) Cognition and international entrepreneurship: Implications for research on international opportunity recognition and exploitation. *International Business Review*, 14, 129-146. <http://dx.doi.org/10.1016/j.ibusrev.2004.04.005>.
- Zahra, S.A., Harry J. Sapienza & Davidsson, P. (2006) Entrepreneurship and Dynamic Capabilities: a Review, Model and Research Agenda, *Journal of Management Studies*, 43, 4, June, p.917-955.
- Zahra, S.A., Neubaum, D. & Larraneta, B. (2007) "Knowledge sharing and technological capabilities: The moderating role of family involvement". *Journal of Business Research*. Vol. (60) Issue 10, p.1070-1079.
- Zahra, S.A. (2007) Contextualizing theory building in entrepreneurship research. *Journal of Business Venturing*, 22(3), p.443-452.

- Zahra, S.A. (2008) The virtuous cycle of discovery and creation of entrepreneurial opportunities. *Strategic Entrepreneurship Journal* Volume 2, Issue 3, p.243-257.
- Zajonc, R.B. (2000) Feeling and thinking: Closing the debate over the independence of affect. In J. P. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (p31-58). Cambridge, UK: Cambridge University Press.
- Zimmer, C. & Aldrich, H.E. (1987). Resource Mobilization Through Ethnic Networks: Kinship and Friendship Ties of Shopkeepers in England. *Sociological Perspective*, 30:422-455.
- Zinger, J.T., Balco, H., Zanibbi, L. & Mount, J. (1996) "An empirical study of the small business support network – the entrepreneurs' perspective", *Canadian Journal of Administrative Sciences*. 13(4), p.347-357.
- Zucker, L.G. (1986) Production of trust: institutional sources of economic structure, 1840–1920. In: Staw, B.M., Cumming, L.L. (Eds.), *Research in Organizational Behavior*, vol. 8. JAI Press, Greenwich, CT, p.53-111.
- Zucker, L., Darby, M.R., & Armstrong, J. (1998) Geographically localized knowledge: Spillovers or markets? *Economic Inquiry*, 36(1), p.65-86.

Appendix A

Letter for Interview Request (In Malay Language)

22hb Januari 2010.

Kepada Syarikat Yang Berkenaan.

Untuk perhatian Ketua Pegawai Eksekutif (CEO).

Dato'/Tuan/Cik,

Per: Permohonan untuk Melakukan Temuduga dan Lawatan Bagi Tujuan Kutipan Data Tesls PhD

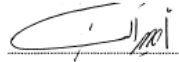
Perkara di atas adalah dirujuk.

Saya ingin memohon jasa baik dan kerjasama pihak tuan/cik untuk meluangkan sedikit masa untuk tujuan temuduga dan lawatan saya ke premis syarikat tuan/cik pada tarikh dan masa yang sesuai. Tujuan temuduga dan lawatan saya ke syarikat tuan/cik adalah bagi memenuhi sebahagian tuntutan kajian tesis saya. Kajian tesis saya bertajuk "Entrepreneurial Opportunity Creation in Biotechnology Industry in Malaysia" mengkehendaki saya menemuduga sembilan pilihan syarikat-syarikat berteraskan bioteknologi di Malaysia. Syarikat tuan/cik telah dipilih bagi tujuan tersebut.

Untuk tujuan itu saya amat berharap agar pihak tuan/cik dapat meluangkan sedikit masa untuk tujuan tersebut diatas. Segala pertanyaan dan maklumat lanjut sila hubungi saya di talian 0136301602 (Malaysia) atau email saya (a.ahamat@shef.ac.uk) atau (amiruddin2008@yahoo.com.my).

Kerjasama dan sokongan pihak tuan/cik didahului ucapan terima kasih.

Yang benar,



Amiruddin Bin Ahamat
PhD Candidate
Management School
University of Sheffield
United Kingdom

Appendix B

Introduction Letter for Field Work Interview Activity in Malaysia



Management
School.

Dean
Professor Keith W Glaister

Management School
The University of Sheffield
9 Mappin Street
Sheffield S1 4DT

Phone: + 44 (0) 114 222 3354
Fax: + 44 (0) 114 222 3348
Email: denise.fletcher@sheffield.ac.uk
Web: <http://www.shef.ac.uk/management/>

5th January 2010

Dear Sir/Ms,

Re: Introduction Letter for Field Word Interview Activity in Malaysia 2010

This is to inform you that Amiruddin Ahamat (080204420) is a PhD student under my supervision and he is currently undertaking research and writing his dissertation in partial fulfilment of the requirements for the of Doctorate of Philosophy in Management through the Management School. His research focus is on entrepreneurial opportunity creation within the biotechnology industry in Malaysia.

In order to address his research questions, he will be required to conduct field work to obtain relevant data from entrepreneurial firms involved in the industry. He will be using various research strategies such as case studies and interviews. To overcome the issues of organizational confidentiality, a hypothetical case has been created to allow participants to contribute based upon their own professional experience in holding or having held similar roles in organizations without having to apply or associate their answers with their current organizations. The data will strictly be used for academic purposes only.

I hereby would like your organization to kindly assist him during his various stages of the interview processes.

Your kind attention on this matter is very much appreciated.

Yours faithfully

pp M Fletcher

Dr. Denise Fletcher
Director of MRes Programme and Research Director,
Centre for Regional Economic and Enterprise Development,
University of Sheffield Management School,
9 Mappin Street, SHEFFIELD, U.K.



Appendix C

First Stage Interview Questions

Entrepreneurial Opportunity Creation within the Biotechnology Industry in Malaysia

A. PROFILES

- A.1. Tell me about the nature of your business?
- A.2. Tell me how many people are employed in your business?
- A.3. Tell me where are they located?
- A.4. Tell me if your business is currently receiving any financial and non-financial assistance from any institutions or individuals?

B. PERSONAL ASPIRATIONS & BACKGROUND

- B.5. Provide a summary of your career background prior to venturing on an entrepreneurial venture.
- B.6. Tell me about your experiences in any previous entrepreneurial ventures. Tell me your opinion on your involvement in entrepreneurial ventures. (Incidental, Systematically Planned)
- B.7. Do you have any prior knowledge in the venture that you are currently involved. (Technical knowledge (i.e. Biotechnology etc), Entrepreneurship knowledge & skills, Others)
- B.8. Tell me how you gain skills such as managerial skills, financial management skills, negotiation skills etc (if any)
- B.9. What do you believe from your experience are the greatest impediments of becoming a self-employed entrepreneur? (Perception, Financial, Family, The environment such as government policy, access to networks, Others)
- B.10. Tell me who motivates you to become an entrepreneur? (Family, Friends, The environments i.e. economic crisis, retrenchment, Others)
- B.11. Tell me what motivates you to become an entrepreneur? (Financial Rewards, Freedom, Ability to be more creative and innovative, Existence of Opportunities i.e. technological change, political/regulatory changes, social/demographic changes)

C. TECHNOLOGICAL CHANGES

- C.12. Tell me about the technology you used in your business?
- C.13. Tell me how you acquired the technology (i.e. patents acquisition, R&D, direct purchase, JV etc)?
- C.14. Tell me if the technology used add values to your business? What are the values (monetary/non-monetary)?
- C.15. Tell me the roles and benefits of these technologies to your business (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

D. GOVERNMENT FUNDING

- D.16. Tell me if your firm is involved in any such relationship with government agencies (*MBC*, *Ministry of Science, Technology & Innovation (MOSTI)*, *Malaysian External Trade Corporation (MATRADE)*, *Universities and Research Institutes*)?
- D.17. Tell me what type of financial relationship is involved (Formal or Informal)? Elaborate more?
- D.18. Tell me if you receive any financial assistance from such relationship to help you with your ventures? If any, what type of assistance (grants/loans/etc)?
- D.19. Tell me the process of getting the financial assistance? Is it easy or challenging?
- D.20. Tell me how you perceive the roles and benefits of the financial assistance in helping your business to grow (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

E. GOVERNMENT POLICY ON BIOTECH & ENTREPRENEURSHIP

E.21. Tell me what you know about government policy on biotech and entrepreneurship?

E.22. Tell me your opinion on the current National Biotech Policy enacted by the government?

E.23. Tell me how this policy benefits your firm directly or indirectly?

F. EDUCATIONAL INFRASTRUCTURE

F.24. Tell me if your firm is involved in any such relationship with educational institutions such as university or research institutes?

F.25. Tell me what type of relationship is involved (Formal or Informal)? Elaborate more?

F.26. Tell me if you receive any assistance from such relationship to help you with your ventures? If any, what type of assistance (monetary/ non-monetary)

F.27. Tell me how you perceive the roles and benefits of the assistance in helping your business to grow (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

G. SOCIOCULTURAL CHANGES

G.28. Tell me your opinion on the current social issues or changes in Malaysia (educational, economy, healthcare, cost of living)? Explain how these issues affect your business or ventures?

G.29. Tell me how your firm responds or reacts to such issues?

G.30. Tell me if your reaction or response to such issues is beneficial to your firm (monetary/non-monetary)?

G.31. Tell me if your firm ever identifies, discovers and creates any potential business opportunities from the issues? Explain how you identify and discover such opportunities?

H. PERSONAL NETWORKS

H.32. Tell me if you receive any kind of support from your wife/husband/partner?

H.33. Tell me if you have any family members or relatives involved in any form of entrepreneurial ventures? What type of businesses?

H.34. Tell me if you receive any assistance from your family members/relatives to help you with your ventures? If any, what type of assistance (monetary/ non-monetary)

H.35. Tell me if you find that the assistance given is helpful to your business?

H.36. Tell me how you perceive the roles and benefits of personal assistance from family members/relatives in helping your business to grow (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

I. FORMAL NETWORKS

I.37. Tell me if you receive any assistance from other related institutions (financial or non financial institutions) to help you with your ventures? If any, what type of assistance (monetary/ non-monetary)

I.38. Tell me your involvement in any social activities such as trade associations, alumni associations, professional membership?

I.39. Tell me the degree of involvement in such activities (active/moderate/not active)?

I.40. Tell me how these social activities help you in building your social networks?

I.41. Tell me how you engage in these types of networks in helping your business grow?

J. COLLABORATIONS (PUBLIC & PRIVATE)

Regulatory & Government Agencies

J.42. Tell me if your firm is involved in any such collaboration with government agencies (*MBC*), *Ministry of Science, Technology & Innovation (MOSTI)*, *Malaysian External Trade Corporation (MATRADE)*, *Universities and Research Institutes*)

J.43. Tell me what type of collaborative relationship is involved (Formal or Informal)? Elaborate more?

J.44. Tell me how you perceive the roles and benefits of the collaboration in helping your business to grow (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

Pharmaceutical Companies

J.45. Tell me if your firm is involved in any such collaboration with any pharmaceutical companies?

J.46. Tell me what type of collaborative relationship is involved (Formal or Informal)?
Elaborate more?

J.47. Tell me how you perceive the roles and benefits of the collaboration in helping your business to grow (new product discovery, new product creation, increase in sales, market expansion, process improvement etc)?

K. GENERAL COMMENTS & FEEDBACK

K.48. Please provide comments on: i. Contents of interview questions, ii. Additional elements to be included or deleted from interview questions, iii. Latest entrepreneurial issues or phenomena within the biotechnology industry and iv. Other related suggestions or ideas.

REMARKS: Technology refers to any new and existing technologies used or bought by an entrepreneur to facilitate the business.

Thank you for your time and kind cooperation

Appendix D

In-Depth Interview Questions

Research Questions

1. What entrepreneurs perceive and understand as sources of entrepreneurial opportunities?
2. How entrepreneurs discover and create entrepreneurial opportunities?

Interview Guidelines

The first part of the question is gain valuable inputs on the perception and understanding of all research participants involved in the interview sessions.

Research Participants

This includes the following: The CEO or Business Owner (s)

Main Issues

The main issues derived from the first interview sessions are then explored and grouped into three categories:

1. Individual Forces (Passion, Prior Knowledge & Entrepreneurial Networks)
2. Institutional Support Forces (Government's Policy/Institutional Funding)
3. Technological & Social Changes

Interview Questions

Part A: Perceptions and Understanding on Issues

1. Tell me about your work, daily activity, your feelings about the business/technology that the company is creating.
2. Did you intend to start a business venture; tell me how the process occurred.
3. Does the term entrepreneurship mean anything to you?
4. What does entrepreneurship mean in a Malaysian context.
5. Is entrepreneurship a positive/negative activity for the economy/society.
6. Tell me about how you noted the gap in the market for your produce/service – how was this perceived as an opportunity.
7. What does 'opportunity' mean to you, your sector, your business.
8. What does 'technological change' in the biotechnology industry and in business in Malaysia generally means to you.
9. What are the key technological changes going on in your industry and in your organisation.
10. Tell me how you see the acceptance of the business community specifically and the Malaysian population generally towards your product or services.
11. Describe the key social changes occurring that have contributed to the creation of your business.
12. Infer what he says in the above statements.
13. What does the term 'network' mean to you in terms of business activities.
14. Do you belong to a business club.
15. Do you have a wide social network.
16. Who do you turn to for advice on business/accountancy/to test ideas.
17. How important were these contacts when starting the venture?
18. How important are collaborations in: finding the idea for your business and getting the business off the ground etc.
19. Tell me if your company is involved in any form of business collaboration?
20. Tell me what type of collaboration?
21. Tell me your role in the collaboration process?
22. Tell me if the business collaboration enables your firm to generate business leads/customers/new products?

23. What are the benefits (or business) opportunities gained from the business collaboration?
24. How do these benefits (if any) from the business collaboration create market/business opportunities for your companies? The interviewer may probe further questions that lead to better inputs in this part.

Part B: Barriers in Entrepreneurship Ventures

1. Ask about barriers to starting their business; finding network contacts; developing their bio technology. Barriers are also important for getting into the institutional situation.
2. How do they get around problems in the business, where do they get additional resources if they need them, how do they overcome problems to do with regulation/getting access to information/getting access to new clients and new markets.
3. Are they involved in any public relation or corporate relation activities with government and non-government agencies. What are the issues faced when dealing with these organisations.

Part C: Sources of Business Opportunity

1. Tell me how your role in Marketing Personnel relates to business activities, discovery of new business ideas, creation of new business opportunity for the company and the industry and Malaysia in general.
2. Tell me how you identify any business opportunity that brings benefits to the company? (from sales cold calling, internet, companies report, newspaper or media reports, news, articles, societal changes in the local community etc).
3. Which are the most important to you.
4. Tell me how you differentiate between business opportunity and non-business opportunity.

Part D: Linking the Issues with the Key Themes of Sources of Opportunities & Discovery & Creation of Opportunities

Technological Changes

1. Tell me what the new biotechnology used in your company is?
2. Tell me if you think the new biotechnologies used in your firms enable you to generate business leads/customers/new products?
3. It is not clear whether you mean the new biotechnologies being developed or technologies to run the business operation.
4. If yes, what are the types of business or benefits from this technology?
5. Tell me what the other benefits or business opportunities gained from the use of the new biotechnology are?
6. Tell me how do these benefits (if any) create market/ business opportunities for your companies?

Business Network

1. Tell me your involvement in any business meeting with potential clients, business promotions?
2. Tell me how frequently you call, meet or email you clients or potential clients?
3. Are you good in communication and persuasion?
4. Tell me how you use this in your daily business activities?
5. Tell me how you manage the marketing activities of your clients or potential clients?
6. Tell me if you ever ask for any feedback or suggestions on how to improve your business relationship with your clients or potential clients?
7. Where do you turn to if you have a business problem/problem with the science/technology process. Probe further on regulatory changes, issues on enforcement, assistance etc
8. Tell me the monetary and non-monetary benefits from the business network relationship to your company?

Personal Network

1. Tell me about your interests, free time and your non-office activities?
2. Talk about your daily life/business activity. From this you can draw out issues to do with the opportunity etc.
3. Tell me also about your family members, their activities?
4. Tell me if you have specific hobbies during your free time?
5. Tell me if you join in any informal business related groups outside your working hours and how this relates to your current role at the company?

Part D: General Comments

Kindly provide any useful comments or suggestions on this interview session.

Thank you for your kind cooperation.