

**The formation of new inter-firm relationships:
A UK offshore wind sector analysis.**

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This work is dedicated to my late mother Denise Hazel Hennelly and my late brother William Matthew Hennelly.

Abstract

The focus of this thesis is to understand the initial formation of inter-firm relationships with the aim of establishing a long-term relationship in the offshore-wind sector. It is common to initiate relationships with pre-existing partners but less is known about how firms form relationships with strangers. This thesis attempts to answer a research question: ‘How and why new inter-firm relationships are built in nascent industries with highly uncertain business environments?’

The research involves three longitudinal case studies (12 pairs of supplier-buyer relationships) of three offshore wind (OSW) suppliers and one OSW buyer, and their relationships with new partners in a highly uncertain market and political context. By examining the early-stage relationships between a supplier and multiple new customers this study provides insights into supplier selection in the OSW sector.

It identifies the main motivations for OSW supply chain companies seeking new partnerships and how they benefit from the new relationships despite facing high market risk and political uncertainty. Furthermore, this research reveals how inter-firm relationships progress (or fail) from one stage to another under high market risk and political uncertainty.

This study argues that the way the selective process is being managed is as important as the levels of compatibility and complementarity and makes theoretical contributions on how to achieve greater understanding and knowledge advancement of dynamic relationship life-cycle management, effects of compatibility and complementarity, uncertainty and time series dimensions are made.

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Abbreviations

BIM Building information modelling

CGF Concrete gravity foundation

OEM Original equipment manufacturer

OSW Offshore wind

JIT Just in time

SIG Special interest group

1. INTRODUCTION

This thesis explores the formation of new inter-firm relationships in the UK offshore wind (OSW) sector. Even though OSW energy is a renewable and secure source of energy (Pregger et al. 2011; Svanberg and Halldórsson, 2013) the OSW sector is still a relatively immature industry (Higgins and Foley, 2014) requiring significant cost reduction. It is believed that collaboration across OSW supply chains could yield significant cost savings (Gov.uk, 2012) but there is a lack of study on how OSW sector achieves supply chain innovation through formation of new inter-firm relationships (Arnbjørn and Paulraj, 2013; Svanberg and Halldórsson, 2013; Jensen et al. 2013). OSW sector with typically high market risk and political uncertainty characterises a unique challenge facing the initiation of any inter-firm partnership (Hamel et al. 1989).

This thesis attempts to answer a research question: ‘How and why new inter-firm relationships are built in nascent industries with highly uncertain business environments?’ This study uses multiple case studies of OSW supply chain companies operating in the UK OSW sector, with the focus on nascent industry with high levels of market and political uncertainty. The research involves three longitudinal case studies (12 pairs of supplier-buyer relationships) of three OSW suppliers and one OSW buyer, and their relationships with new partners in a highly uncertain market and political context. The relatively immature UK OSW sector is also characterised by many formations of a new relationship between firms with no pre-existing ties. Many of the companies in the case study are new entrants to the OSW market; therefore, the research also offers insights into the early formation and development of business relationships for exploring innovative collaborative advantage with firms from different sectors.

Contributions are made to the supply chain and energy sector management literature in a number of aspects. Understanding how new inter-firm relationships are born and develop into long-term relationships has been recognised as an important research agenda (Villena et al. 2011; Lumineau and Henderson, 2012; Palmatier et al. 2013). New inter-firm relationships are formed through a selective process where organisational characteristics influence the likelihood of relationship formation (Powell et al. 2005). New inter-firm relationships are formed during the initial stages of an inter-firm relationship life-cycle from awareness to exploration, formation, etc. (Ford, 1980; Dwyer et al. 1987; Ring and van de Ven, 1994). Though the models of inter-firm relationship life-cycle proposed by

these scholars help to name the stages of an inter-firm relationship, less is known about how the relationship can progress from one stage to another over time (Lewicki et al. 2006).

This research reveals how inter-firm relationships progress (or fail) from one stage to another. Furthermore, it is common to initiate relationships with pre-existing partners but less is known about how firms form relationships with strangers. By studying the formation of new relationships between a firm and some new and existing partners, this study sheds light on their differences. It identifies the main motivations for OSW supply chain companies seeking new partnerships and how they benefit from the new relationships despite facing high market risk and political uncertainty. There has been extensive research on why firms enter alliances or partnerships: motivations include the chance to learn from one another (Hamel et al. 1989), enter new markets and technologies (Kogut, 1991), access complementary assets (Rothaermel, 2001), enhance innovativeness (Shan et al. 1994), share risks (Ohmae, 1989), and improve performance in early stages of the relationship (Baum et al. 2000).

Supplementary research has shown that a firm's tendency to form relationships depends on the firm's resources and external environment (Park et al. 2002), strategic and social position (Eisenhardt and Schoonhoven, 1996), and technical, commercial, and social capital (Ahuja, 2000). Others attempt to determine what firms can do to achieve meaningful and beneficial inter-firm relationships; common behaviours such as trust building, information sharing, and commitment have been identified (Kaufmann et al., 2018; Mai Anh et al. 2018; Palmatier et al. 2013; Wilson, 1995; Anderson et al. 1987; Dwyer et al. 1987). In addition, both resource compatibility and complementarity between firms are also arguably the drivers for such behaviours (Mitsubishi and Greeve, 2009).

By examining the early-stage relationships between a supplier and multiple new customers this study provides insights into supplier selection in the OSW sector. This study argues that the way the selective process is being managed is as important as the levels of compatibility and complementarities. To verify this argument, this study identifies production resources as observable criteria and company culture/philosophy as unobservable criteria used to determine match quality, and specifies that firms judge match quality as high when these criteria show complementary and compatibility, respectively. Further, the study analyses the selective process of several supplier-buyer

dyads in their early stages, where suppliers make investments in the relationship to improve match quality, and to build trust in order to increase the chances of winning further orders and developing long-term committed relationships with their customers, and customers' efforts in searching for compatibility and complementarities.

In the next section a review of the literature on relationship life-cycle theory and relationship constructs such as compatibility and complementarity are presented. This formed the basis for the development of a conceptual framework. The framework will be explored using a case study approach which will be detailed in Chapter 3. The theoretical contribution of this work will be the advancement of a framework and also to pinpoint theoretical contributions to specific constructs and categories within a relationship life-cycle context. It will extend theory by identifying, confirming, modifying and rejecting key relational characteristics impacting on dyadic formation, development and evolution in uncertain market environments. The main contribution will be in the area of supply chain relational theory (further details are presented in chapter two). In short, the theoretical contribution is anticipated to be made achieve greater understanding and knowledge advancement of dynamic relationship life-cycle management, effects of compatibility and complementarity, uncertainty and time series dimensions.

2. RESEARCH BACKGROUND

This chapter reviews the literature on the different theoretical approaches to modelling the relationship life-cycle with specific reference to changing dynamics, characteristics and power perspectives. An initial thread of an idea, the “relationship life-cycle” is proposed and then this idea is developed through a review of literature which utilises and applies it in different industrial contexts.

The main unit of analysis (relational construct, dynamics and buyer-supplier relationship life cycle), guided the selection of papers, search strategy, inclusion and exclusion criteria and method of synthesis. The review process was driven by the following research question: How and why new inter-firm relationships are built in nascent industries with highly uncertain business environments? By focusing on the research question, key research areas and relevant publications were identified.

To conduct a literature review, this thesis followed Denyer and Tranfield’s (2009) literature review process (see figure 1 below).

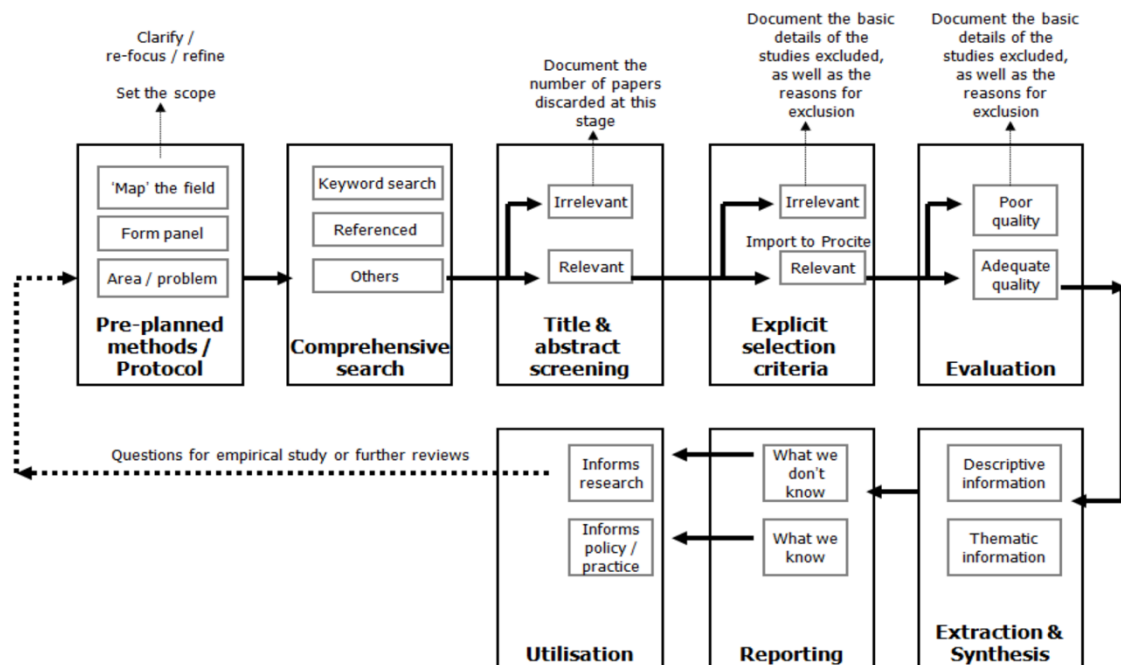


Figure 1 Literature review process (adapted from Denyer and Tranfield (2009))

The field of study was mapped and the scope in terms of area and problem was set. This was then followed by the researcher forming a review panel made up of subject experts from both academia and practice to provide support and guidance. The following

keywords were clarified by leading experts in the field consulted by the researcher, these were:

- Relationship life-cycle;
- Supplier relationship;
- Buyer-supplier relationship development;
- Uncertainty;
- Trust;
- Information sharing;
- Commitment;
- Supplier perspective.

The keywords were then entered into various databases such as Scopus, Springer, Web of Knowledge, ABI inform, Taylor and Francis and Emerald. The references and abstracts of the most highly cited articles were downloaded into EndNote, a reference management software program. The researcher then conducted a screening of abstracts to ensure the article's relevance with the research objectives and identify duplicated articles. To ensure validity of the literature review it was necessary to apply a number of inclusion and exclusion criteria. Research articles were eligible for inclusion if they focused on the formation of a new relationship, involved nascent industries, studied the supplier perspective, evaluated supply chain innovations and applied life-cycle models in buyer supplier relationships. Exclusion criteria focused on papers that were in progress or were not written in English. There were a few rounds of snowballing from key papers found by the researcher and the researcher chose to include quantitative, qualitative and case study papers in order to have a diversity of epistemological approaches.

After the explicit selection criteria came the evaluation of remaining articles, to which the researcher decided which were poor quality, to be removed and those with adequate quality kept. The papers resulting from the search were scrutinised for their quality in terms of their scientific rigor – suitable research methods being applied; credibility – well-presented findings, and relevance – findings were useful for suppliers forming new relationships. It was then a process of extraction and synthesis of the articles in terms of what descriptive information they offered and what thematic information they provided. The next stage involved reporting on articles that shed light on what was known in the

research field, thus informing policy and practice, as well as what was not known and needed further exploration this informing the research agenda.

The literature will be critically interrogated with the purpose of theoretically framing a model of relationship evolution. This will subsequently inform the conceptual development of theoretical categories for application to several case studies. The chapter will report the two main approaches to modelling life-cycle evolution. Then it will report various studies that have adopted the respective approaches with examples. It concludes with a framework to guide the case study research investigation.

2.1 Life-cycle theoretical approaches –DSO theory

In reviewing the previous academic literature on relationship life-cycle theory, it is apparent that there have emerged two prominent schools of thought. This literature primarily originated in the field of industrial marketing and purchasing but subsequently has been applied rigorously in the field of operations and supply chain management (Vanpoucke et al. 2014). Dwyer, Schurr and Oh (1987) suggest that relationships evolve in a rigid process moving from one relationship stage into another. This is commonly referred to as “DSO theory”. It states that the relationship life-cycle evolves over time through a total of five stages. These stages are progressed through slowly. At each stage there are differentiating characteristics, which are based on the properties of the relationship rather than the individual actors involved in the exchange. DSO explains that relationships will develop over time where trust and shared norms are developed over a predictable series of events happening in a set order. DSO theory offers simple propositions for each stage of the development of a relationship, where many relationship properties follow the same paths, rising and then falling methodically. For instance, relationship properties such as “trust” and “dependence” are low in the “exploration” stage, then rise in the “expansion” stage, climax in the “maturity” stage, and ultimately fall as the relationship dissolves.

Buyer–supplier relationships can be seen as developing over time, through stages in which partners consider each other in different ways. Dwyer et al. (1987) propose a framework using exchange theory which is based on comparisons of a series of discrete transactions or relational exchanges. Macneil (1980) posits that inter-organisational relationships typically start with low norms and evolve gradually over time. Dwyer et al. (op. cit.) identify five distinct stages in a relationship: “awareness”, “exploration”, “expansion”, “commitment”, and “dissolution”; in the awareness stage, before interaction

between the two parties has taken place, a firm may position themselves to enhance their attractiveness to the other party.

2.1.1 Awareness stage

In DSO approach that has been selected for this investigation the initial stage of a buyer–supplier relationship is noted by Dwyer et al. as the “awareness” stage and this is first defined as: “Party A’s recognition that party B is a feasible exchange partner”. In many cases, the buyer might already be purchasing products or services from the seller, but then decides to move into a deeper relationship with the supplier, in order to accomplish internal goals, such as lowering their costs through a JIT system. In the initiation stage, the buyer and supplier develop relation-specific routines so that they are better able to engage in supplier development activities (e.g. tacit knowledge exchange).

Communication is important in the initial stages of development to establish social bonding and the actions of the partners begin to define the level of trust that will shape the future of the relationship. Wilson (1978) proposes that the initial stages of relationship development involve source legitimization and information exchange. In these interactions, partners seek common ground, on which to build social bonds and a trusting relationship. In a later work, Wilson and Vlosky (1998) argues that “trust”, “social bonds”, “mutual goals”, and “power/dependence” issues are more important in the early stages of relationship development

2.1.2 Exploration stage

After the interaction has taken place (for instance, a transaction), the relationship then progresses into the exploration stage. Once in the exploration stage, trial purchases will take place to test and evaluate each partner’s capabilities; this enables the partners to develop trust in one another as well as be jointly satisfied with each other’s performance. Next, in order to move to the expansion stage, partners need to view the potential rewards as sufficiently large to take the effort to start negotiating and interacting intensively. Once in the expansion stage, partners will then set up integration initiatives and indirectly test for their joint “goal compatibility”, “integrity”, and “performance”.

The expansion stage involves increased “risk taking”, a growing “mutual dependence”, and stronger “commitment”. Jap and Ganesan (2000) expand on Dwyer et al.’s framework by studying the benefits, satisfaction and interdependence in each stage of the buyer–supplier relationship. They state that the exploration stage is very much a search

and trial phase whereby potential obligations and benefits are assessed, with uncertainty reduction and the potential benefits of continued interaction considered as central goals (Jap and Ganesan, 2000). The expansion stage implies an increased interdependence between the two parties and this turns transactions into long-term commitments, by infusing them with shared norms and values.

In the exploration stage, Dwyer et al. (1987) suggest that there is a period of trial and testing of potential partners. Wilson (1995) suggests constructs such as “performance satisfaction”, “comparison level of alternatives” and “trust” are active constructs in the buyer–supplier relationship. If a buyer is already acquainted with a potential supplier, then it is easier to make judgements on such variables compared to if the potential partner is unknown. If the potential partner is unknown or untested, having a known reputation for performance and trustworthiness are key measures used to decide on whether to begin the process of relationship development.

Social bonding begins when buyers and suppliers interact in the early stages, where initial interaction may begin the development of mutual trust. Wilson (1995: 16) comments: “... although uncertainty is high, trust begins as one partner earns the respect and trust of the other”.

Dwyer et al. explain that during the exploration stage the relationship is in a fragile state as both parties have limited commitment and either could end the relationship very easily. The buyer gains awareness of the contribution the supplier can make to a relationship relative to alternative suppliers. During the exploration stage, Vanpoucke et al. (2014) find that buyers and suppliers tend to work together on a transactional basis, without any contracts or initiatives in place, and no guarantees made of a long-term relationship. The parties often would enter the exploration stage based on assessments of the traditional performance dimensions such as: “cost”, “flexibility”, “delivery” and “quality” of the products and services offered. They mention that trust is built by increasing communication levels through negotiations and developing small joint projects that are transactional in nature; this creates trust from the buyer who is then willing to move into the expansion stage (ibid.). They find ‘pattern starts with initiatives for logistics responsiveness, followed by knowledge exchange initiatives and finally initiatives to increase the use of common resources. Each of these initiatives are triggered by specific opportunities and are emergent in nature’. Thus, it is necessary to gain a greater

understanding of the triggers that help move a relationship from its early formation stages to a successful committed relationship.

2.1.3 Expansion stage

Miller and Friesen (1984) show that in the expansion stage the viability of the potential alliance is the main objective. This stage is said to be made up of resource structuring behaviours such as obtaining financing and hiring and training employees to implement marketing, sales, and operational duties (Rutherford et al. 2003). They do this to support their organisation's business model. Zahra et al. (2009) suggest that organisations in the early stage of relationship formation develop alliances, in order to acquire critical resources from their partners. Furthermore, the organizing of firm resources during the expansions stage helps both partners to develop flexibility and ways to adapt to new circumstances and competitive settings; however, it should be noted that managers should be careful not to commit resources in ways that cannot be reversed if changing conditions necessitate (Cainarca et al. 1992).

Morrow et al. (2007) suggest that experimental resource allocation patterns are used by partners: "to identify potential valuable and rare operational and product configurations that can create a sustainable competitive advantage". Moreover, studies have shown how firms in the start-up stage concentrate on structuring their resource portfolio, to then bundle these resources to form capabilities on which the alliance's business model will operate (Sirmon et al. 2011).

2.1.4 Commitment stage

As firms begin to mature, they are able to gain greater understanding of their internal and external environments. For mature firms to sustain competitive advantage they must continue to pursue innovation (Agarwal and Gort, 2002). One way of generating new innovations is to hire fresh human capital (i.e. the recruitment of executives with innovative and creative flair); also, managers need to have a supportive governance structure, that is designed to facilitate innovation, in the early stages of the life-cycle. This is to ensure that it is not prohibiting innovation (Miller and Friesen, 1984). Thus, a firm in the mature stage of relationship development must orchestrate its resources in a way that achieves a balance between "innovation" and "efficiency" (Sirmon et al. 2011). This will require managers to emphasize employee morale and commitment (Smith et al., 1985). There is a need for a participatory approach to management and a proactive

approach when dealing with the firm's external stakeholders (Jahawar and McLaughlin, 2001).

During maturity, it is likely that firms will explore new ways of orchestrating their resources to create new innovations or value. For instance, firms may want to exploit resources available in the alliance to increase the efficiency of their operations. By exploiting the resources available firms can restructure resources to identify and replace inefficient processes or capabilities with more efficient ones. On the other hand, they may want to explore the resources in the alliance, where they can structure their resources in a way that creates new knowledge and value and contributes to the development of new innovations.

Furthermore, by pooling the resources of an alliance it is possible to create capabilities that supplement existing products and processes which can then aid the firm in finding opportunities to enter new markets. In the mature stage, a firm may want to use its resource pool to gain greater influence in its external environment and to strengthen its competitive position in the market (Smith et al. 1985). Through its dynamic managerial capabilities, a firm can leverage its resources for exploitation and/or exploration concurrently; this can provide the basis for entering a new growth stage (Adner and Helfat, 2003). Otherwise, if a firm fails to manage its resources in ways that create new value, they are likely to enter the decline stage of the relationship.

2.1.5 Dissolution stage

When the buyer-supplier relationship is in the decline stage, both parties will engage less in relation-specific routines and reduce relation-specific investments, making supplier development less effective (Dwyer et al., 1987). Drivers of dissolution have been studied where Hocutt's (1998) study notes three ways a relationship can dissolve, specifically: buyer's decision, supplier's decision or a mutual decision. Chen et al's. (2019) study on supplier performance and strategic relationship dissolution found that the likeliness of a relationship being terminated increases when a supplier with a reasonable and marginal history of performance commits the same mistake. Dissolution begins when a partner privately starts evaluating their dissatisfactions with the other partner and deciding that the costs of continuing the relationship far outweigh the benefits.

2.2 RV Life-cycle theory

An alternative theoretical viewpoint on relationship development is suggested by Ring and Van de Ven (1994) and they propose their theory which is entitled: “RV”. The RV theory of relationship development is applicable to any type of organisational relationship, and not solely that of the buyer–supplier relational context. Compared to the previous DSO theory (which suggests that there are five separate stages which linearly progresses one at a time), RV posits that three steps occur within each stage of DSO theory. It aims to understand the relationship from the behaviour of individual managers of both organisations; furthermore, it is a cyclical process where each stage can be repeated until the relationship is terminated. In each stage of relationship development RV suggests that there will be repeated cycles of “negotiation”, “commitment” and “execution”, even when parties are not fulfilling their commitments, whilst the DSO view holds that relationships that fail are abandoned as they are difficult to revive and are seen as a liability. Another key difference between the two theories found by Jap and Anderson (2007) is that individuals are critical to successful relationship development (RV) compared to the DSO view that it is the properties of the relationship that are the more important factor. These authors also found the DSO view predictively valid but overly complex stating Rousseau et al’s (1998) model a simplification of it. Where Rousseau et al (1998) stated boundaries between expansion and maturity stages can blur from the development of trust, commitment and an assessment of alternatives. Furthermore, authors (Jap and Anderson, 2007; Rousseau et al., 1998) have maintained that not only can life-cycle stages be skipped or merged together but there can also be back and forward motion between stages, in particular, movement towards the dissolution stage. Further stating that relationships do not necessarily evolve in a linear fashion and do not need to include all stages. Instead of the typically linear path through all relationship stages Medlin (2004) suggests: “each relationship is somewhat unique, making quantitative analysis of relationship types according to lifecycle stage theoretically suspect”.

In RV theory, there are three key steps to the relationship development. The first stage starts with (1) “negotiation” to begin the relationship. The negotiation phase involves partners developing joint expectations on their motivations as well as possible investments and risks of the initiative they are hoping to work on. This is then followed by (2) “commitment” to an agreement made by the parties. The commitment stage involves the parties coming to an agreement on future actions through a formal relational contract or informal psychological contract. The relationship is then assessed in terms of

its progress. In (3) the “execution” stage, the commitments discussed by both parties are performed and the parties will become more familiar with one another, which may lead to starting up a new integration initiative, and the parties would then follow all three stages again.

According to Ring and Van de Ven (1994), formal and informal negotiation and commitment mechanisms should be in balance throughout the life-cycle of inter-organisational relationships. For instance, in the negotiation stage, there is a need for formal bargaining; however, this should be accompanied with informal sense making. In the commitment stage, formal legal contracts should be accompanied by psychological contracts. They argue that when significant imbalances occur between formal and informal processes in repetitive sequences of negotiation, commitment and execution, the likelihood of dissolving the relationship increases.

The dynamics of a relationship requires a processual understanding of how and why such relationships, develop, evolve and dissolve over time (Jap and Anderson (2001), thus developing a lifetime theory of business relationships is exceptionally difficult. Whilst inter-organisational research has subsided recently, there has not been enough research focus on how relationships evolve over time (Arino and de la Torre, 1998; Jap and Anderson, 2007), there is a lack of studies on the dynamics of business relationships (Eggert et al. 2006; Wilson, 1995).

During a business relationship partners continuously monitor and assess the costs and value from being in business together, when one partner in the relationship feels they are not receiving a zero or negative output with no potential of reversal, the relationship begins to dissolve (Park and Ungson, 2001). Fichman and Levinthal (1991) found a relationship is at its most tenuous where the relationship can be terminated at any point, in comparison to a relationship in the expansion or commitment stages experiencing an escalated injustice from one partner will result in a bitter and disappointing relationship termination. Relationships that stall in development for months may be enough for the relationship to be discarded, while in other environmental settings a relationship that stalls for years may not be long enough. Thus, it is important to understand that relationships follow a non-linear path, moving back and forth depending on the level of activeness or passiveness.

It is important study the dynamics of a relationship at the micro (dyadic and/or/interpersonal) levels that determine the direction of organisations at the macro levels

(Rousseau et al. 1998;). While the DSO and RV theories provide useful insights into the evolution of business relationships, both theories do not go into depth on the factors that provoke changes in the “perceptions, attitudes, affects and/or behaviours of the actors involved in the inter-organisational exchange relationships” ... “it is the changes (any progression or regression) primarily in the perceptions, beliefs, orientations, affects, mind-sets etc. of the boundary spanners (or alliance managers) that mark the beginning/end of the different phases of relationship evolution for, after all, it is the people not the inanimate organizational entities who make decisions” (Yaqub and Windsperger, 2016: 7). Jap and Anderson (2007: 273) comment: “Much about relationship dynamics remains to be explored and understood. For example, one un-researched area involves the drivers that move the relationship from one phase to the next. What factors prod the relationship from an exploratory phase into build-up? From awareness to exploration? How do firms manage to put aside a disappointing history to renew their relationships?”

It is also important to note that to date there has been no empirical study providing an integrated and comprehensive explanation as why and how business relationships evolve over time. “Most of the (empirical) research endeavours have focused on what difference does it make when the beliefs, perceptions, affects etc. of the exchange partners change while assuming that ‘something’ creates and moderates the effects of these changes” (Yaqub and Windsperger, 2016: 8). As a result, there is still a need to examine the triggers that help move a relationship from one stage to the next, whether from the early stages (awareness to exploration) or in the later stages (commitment to dissolution). This thesis aims to contribute to business relationship theory by filling this research gap.

2.3 Conceptual Framework

Figure 2 below is the conceptual framework derived from the literature. The framework draws upon several key areas of buyer-supplier relationship formation and development. Two theories were integrated due to their varying nature in describing how a relationship develops over time, taking a relationship life-cycle approach. These include Dwyer et al.’s (1987) linear and discrete relationship life-cycle theory which breaks down buyer-supplier relationships into five distinct stages of development, namely, awareness, exploration, expansion, commitment and dissolution. However, a relationship may not always travel in a linear direction, thus it was important to include Ring and Van de Ven’s. (1994) relationship life cycle theory that views relationship development as cyclical and

iterative. The conceptual framework posits that Ring and Van de Ven's cyclical process takes place within each stage of Dwyer et al.'s relationship stages rather than being separate.

It was also deemed very important to study the triggers that enable a relationship to progress or reverse from one stage to the next. The literature covered in this thesis focuses on specific relational constructs that help a relationship progress and development over time, these are identified as; trust, commitment, information exchange and governance. However, existing literature does not focus on other dynamics that can have an influence on these relational constructs thus effecting relationship development. These have been identified from the literature as relationship compatibility and complementarity.

Compatibility is comprised of values, culture, work routines, product, process and personal relationships. Relationship compatibility can affect relational constructs such as trust, commitment, governance and information exchange. For instance, a relationship with high compatibility in values, culture, product and process can positively influence commitment and trust as well as improve information exchange between a buyer and supplier. On one hand, a higher level of compatibility can lead to trust being established much earlier, helping progress a relationship through early life-cycle stages at a faster rate. The levels of compatibility between exchange partners can also affect the speed at which a relationship passes through Ring and Van de Ven's. (1994) cyclical process of relationship development (e.g. the negotiate, commit and execute stages). For instance, high levels of compatibility can enable partners to negotiate, commit and execute on opportunities faster than a relationship suffering from multiple incompatibilities. Furthermore, when two parties engage in high levels of information sharing, they will have more information to understand compatibility that will influence the types and nature of work routines and personal relationships between a buyer and supplier. On the other hand, if a relationship is fraught with incompatibilities between the partners, the building of trust and commitment may take longer which in turn affects the speed of relationship development through life-cycle stages and could even see the relationship back tracking through stages.

Another important dynamic is relationship complementarity – which encompasses technology, product, process, market knowledge, technical expertise and reputation. Relationship complementarity can increase the levels of trust or commitment in a relationship, for example, a partner with high levels of market knowledge, technical

expertise or technological capabilities can positively influence the amount of commitment and trust sought from their partner and therefore affect the speed of relationship development through life-cycle stages. This is also the case for Ring and Van de Ven's (1994) cyclical process where high levels of complementarity can speed up the negotiate, commit and execute phases of relationship development. However, when partners exhibit low levels of complementarity be it product, process, technology, expertise or reputation the building of trust or commitment as well as the willingness to exchange information becomes more challenging and may negatively influence the levels of commitment or information exchange in a relationship, causing the relationship to reverse or stall through life-cycle stages. In regards to Ring and Van de Ven's (1994) low levels of complementarity are likely to have a negative impact on the speed of a relationship passing through the cyclical stages of relationship development, such as negotiation, commitment and execution.

Both of these relational dynamics have been integrated into the conceptual model as they help to explain the reasons why relationships may progress or fail to develop over time. The framework illustrates the key areas in relationship management highlighted from the literature review, i.e. relational constructs, complementarity and compatibility and their potential linkages/ influence on relationship stages, also considering the impact of uncertainty on relationship constructs and life-cycle stages.

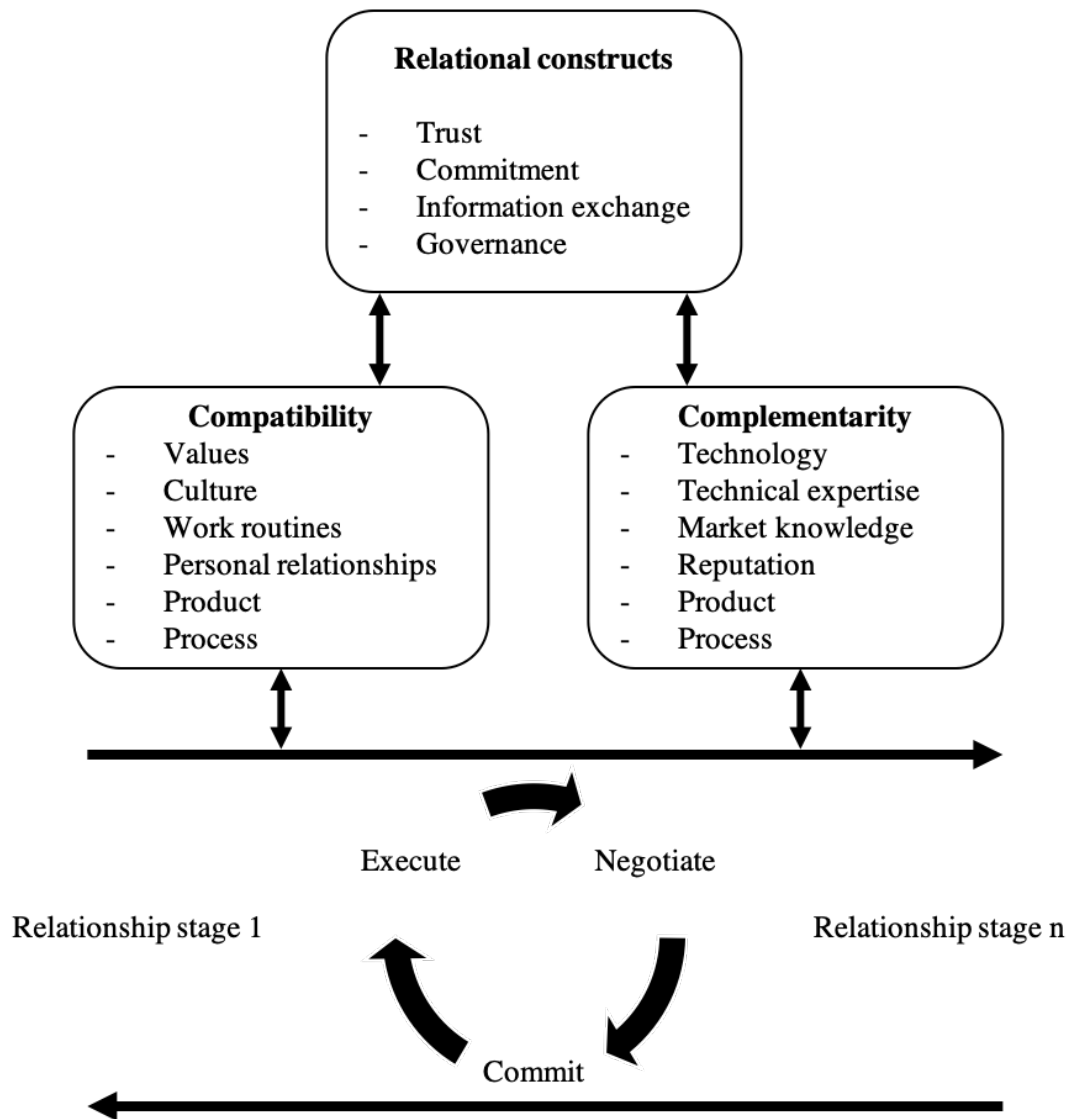


Figure 2 Conceptual framework

2.4. Relationship dynamics in life-cycle theory

Whilst both the “DSO” and “RV” approaches have differences in their explanatory methods (“relational” v. “individual”) and structure (“one-time sequence” v. “repeated cycles”) both these standpoints refer to Macneil’s (1980) relational norms methodology and share similar predictions.¹ Moreover, both theories study unfolding events in the development of a relationship rather than other theories that study the conditions at the time of finding (Arino and de la Torre, 1998). Knoppen and Christiaanse (2007) find that

¹ According to Macneil (1980), there exists a set of transactional as well as relational norms to understand an economic exchange between two partners. The former includes nine contractual norms, and the latter encompasses four relational norms, namely role integrity, solidarity, flexibility, and supra contractual norms. This set of 2 relational norms has been successfully used to explain the effectiveness of marketing relationships (e.g. Paulin, Perrien and Ferguson, 1997).

the relationship stage of the buyer–supplier interaction has an influence on inter-organisational adaptation. However, they do not investigate the influence of relationship length or life-cycle in much detail. They conclude from their case studies that: “partners admitted that trust had grown over the years, by living through the good and bad times together” (ibid. p.217). The authors suggest that future research should adopt a longitudinal approach to studying relationship dynamics.

Relationships can be dynamic as they are subject to change over time, specifically, relational constructs play an important part in a relationship’s performance and can change the life cycle of a relationship by speeding up, slowing down or reversing relationship development (Palmatier et al. 2013; Palmatier et al. 2007). This thesis examines compatibility and complementarity of relationships and their effects on buyer-supplier relationship development, in particular, how they affect trust, commitment, information exchange and governance, changing the dynamics of a relationship.

Both Dwyer et al. (1987) and Ring Van de Ven (1994) agree that relationships evolve through life-cycle stages at different speeds. For example, Dwyer et al. (op. cit.) state that the exploration stage may be very brief or include an extended period of testing and evaluation. Some firms move through relationship stages faster than others. Vanpoucke et al.’s (2014) study shows how some relationships take three years to “explore”, others stay for more than ten years in the exploration stage. Similarly, in the expansion stage some relationships need a little time to move on to the commitment stage, while other relationships need a lot of time. As such, all relationships move through the same stages, but at different growth rates with: “each relationship having its own development speed” (Vanpoucke et al. 2014). They find that relationship development follows a pattern of initiatives for logistics responsiveness followed by knowledge exchange initiatives and finally initiatives to increase the use of common resources. Consequently, it is necessary to understand triggers for moving from one relationship stage to the next and how this transition can be speeded up in order to reach a more committed long-term buyer-supplier relationship.

A significant body of research has been published on supplier development. For example, in 2007, there were nine published papers on supplier development activities in operations and production related journals (Araz and Ozkarahan, 2007; Carr and Kaynak, 2007; Chan and Kumar, 2007; Krause et al. 2007; Krause and Ellram, 1997; Lee and Humphreys, 2007; Li et al. 2007; Modi and Mabert, 2007; Rogers et al. 2007).

However, all of the above studies look at supplier development from a single point in time (snapshot) rather than taking a longitudinal approach or acknowledging the life-cycle of the buyer–supplier relationship. While many of the studies focus on relational constructs such as trust, information sharing and commitment they do not consider the effects of these constructs on life-cycle relationship dynamics. Some studies look into the time contingent value of social capital, they include:

- i. Krause et al. (2007) who explore the relationship length between the buyer and supplier as a “measure” and suggest a simple positive linear relationship between relationship length and improvement. It is suggested (ibid. p.534) that path dependence is not captured in the evolution of social capital. They also point out with regard to relational capital that: “past transactions may alter the calculus for further transactions” as well as the “prior history of cooperation between firms”. These have an impact on buyer–supplier relationship outcomes. The authors do not factor in the path dependence of buyer–supplier relationships into their model. This could have been modelled by including a measure of relationship length or relationship life-cycle as a moderator between supplier relationship management and performance.
- ii. Kotabe et al.’s (2003) study explores two forms of knowledge exchange taking place between a buyer and supplier (that can be referred to as supplier development (Krause et al. 2000; Wagner and Bode, 2006)) and its effect on supplier performance (including relationship length as a moderator). The results of the study illustrate that relationship length does not moderate the link between “technical exchanges” and “performance improvements”; however, it does moderate the link between technology transfer and supplier performance improvements. This leads Kotabe et al. (2003) to argue that simple technical exchanges can enhance supplier performance, independent of the history of the relationship.
- iii. Wagner (2011) study explores the impact of the dynamic nature of buyer–supplier relationships on the outcome of the supplier development activities. He proposes a model and then tests this on a cross-sectional sample using a quasi-longitudinal analysis. The aim is to illustrate how

different stages of the relationship life-cycle act to moderate supplier development activity as well as the buying firms' performance. Wagner's approach accounts for the life-cycle of the buyer-supplier relationship by including a squared term for "relationship length" as a moderator for the relationship between the buying firms' supplier development activities and the improvement in the buying firms' performance. Furthermore, they suggest that "the inclusion of a squared term for relationship length, as a moderator, is a much better reflection of the dynamic nature of buyer-supplier relationships over the relationship life-cycle" (2011: 279).

In the industrial marketing and purchasing literature much importance is placed on the dynamic nature of buyer-supplier relationships (Palmatier et al. 2013, Jap, 2001), where researchers have been encouraged to include the relationship life-cycle in their analysis. Various industrial marketing scholars have emphasized that many of the interactions between buyers and suppliers and their outcomes are contingent on the stage of the buyer-supplier relationship (Dwyer et al. 1987; Frazier, 1983; Jap and Ganesan, 2000; Medlin, 2004; Wilson, 1995).

Whilst there have been many different approaches to categorizing the different phases in the buyer-supplier relationship, in all relationship models the phases are characterized by the direction and strength of growth (e.g. initiation, maturity, and decline). The relationship life-cycle influences the development of relationship marketing constructs such as cooperation, information sharing, and trust (Jap and Ganesan, 2000; Wilson, 1995). Therefore, it can be intuitively proposed that supplier development would be more successful if the buyer-supplier relationship is at a stage where the levels of cooperation, information sharing, commitment and trust etc. are high (maturity) rather than low (initiation or decline).

Wagner (2011) posits that supplier development has low impact at the early and late stages and high impact at the intermediate stages of the relationship life-cycle. This observation is also supported by Jap and Anderson (2007). They find that relationship factors such as information exchange or goal congruence are low in the exploration and decline stages of the relationship, whilst high in the build-up and maturity stages. Wagner's (op. cit.) results show that the effectiveness of a buying firm's supplier development activities is moderated by the relationship life-cycle. He mentions that: "... critical constituent and building blocks of supplier development are trust, communication

and information exchange, and relation-specific investments (time, resources, know-how)". He also mentions that establishing trust, strong communication, and information links, and building up relation-specific assets is time-bound (Fichman and Levinthal, 1991; Jap and Anderson, 2007; Kogut and Zander, 1992). Despite the view that relational constructs are not as important in the early stage of relationship develop, this study endeavours to consider the early stages in more detail.

Wagner (op. cit.) points out that: "... prior to investing in supplier development activities, the buying firm should carefully assess the status of the buyer-supplier relationship, because the effectiveness of the supplier development depends on the life-cycle stage of the relationship". Furthermore, he points out that the buying firm should not take part in direct supplier development activities (during the initial and decline stages of the relationship). He agrees with other studies that "direct" supplier development activities should be preceded with "indirect" supplier development activities (Krause et al. 2000; Wagner and Bode, 2006).

When in the declining stage of relationship, direct supplier development activities should be replaced with indirect supplier development activities. Palmatier et al.'s (2013) study shows how trust, communication and investment capabilities influence commitment velocity by enabling the continual exploration (through communication) and exploitation (through investment) of opportunities. Palmatier et al. (op. cit: 14) also find that communication capabilities are: "most critical when industry turbulence is high".

Jap and Anderson (2007) hypothesize that relationship properties within the context of the partnership life-cycle would reach their highest level during the mature phase, and their lowest point in the decline phase. Firstly, the data shows that the mature phases tend not to coincide with the peak point in relationship development. The parties involved cooperate, work to the same schedule, and consider the future of the collaboration, but in spite of this, the mature phase of the relationship seldom features higher level relationship properties than the build-up; indeed, it often features slightly lower level relationship properties.

This finding confirms the work of Cannon and Perreault (1999), who conclude that ongoing buyer-seller relationships do not necessarily have to be relationally close. They argue that the average buyer or seller is unlikely to choose the relationship type best suited to their circumstances. Rather, the parties involved improvise, and those who are successful find partially correct solutions at best. Extant research emphasizes the

importance of managing expectations, as unrealistic expectations formed without a mutual learning process can lead to unmet expectations, suspicion and damage to the partnership (Ariño and De la Torre, 1998).

It has been suggested that relational properties can follow a different, unexpected pattern (Jap and Anderson, 2007). The properties upon which successful long-term relationships are based – complementary goals and high-level information sharing – tend to peak during the build-up phase, rather than during the maturity phase. After the establishment of congruent goals and an information exchange mechanism, it appears that routines take over. These elements can then gradually decline in a manner which is not detrimental to the mature relationship.

Jap and Anderson (ibid.) conclude that goal congruence becomes differentially important as varying levels of ex post opportunism come into play. There is a lack of empirical differences between the maturity and build-up phases. This is in accordance with the findings of Rousseau et al. (1998) and Madhok and Tallman (1998). The latter suggest that organisations tend to underestimate the level of idiosyncratic investment required to produce an optimal relationship. In the event of an organisation's eventual realization of the required level of idiosyncrasy, they tend to be reluctant to make the necessary investments, due to the difficulty of calculating their return on investments.

Rousseau et al. (1998) suggest that the threshold between the build-up and maturity phases may be blurred, especially once the dyad has fostered a shared history and a relationship of trust and harmony. They break down the process for the formation of trusting relationships into three stages: building (forming/re-forming), stability and dissolution/decline.

The formation of a relationship is another research area that informs how new supply chain partnerships are being created. The value generated from the formation of a partnership is boosted when partners bring different resources and capabilities to the relationship but share similar social characteristics. These social similarities are very important to relationship as they provide the base for the formation of relationship capital as well as socio-psychological and behavioural aspects of a relationship that help to build mutual trust and commitment, and encourage information exchange (Cullen et al. 2000; Heide and John, 1992).

Jap and Anderson (2007) provide further insight into the processes of relationship solidification and dissolution. They identify the bonding process which takes place

throughout the life-cycle. It is shown that in the build-up phase, as a party's idiosyncratic time and adaptation investments are at their highest level, the consideration of alternatives (e.g. alternative suppliers) will be at its lowest point. In the decline phase on the other hand, we see these investments reach their lowest point, whilst the consideration of alternatives is at its peak.

In sum, resellers tend not to actively seek many suppliers throughout the lifespan of a relationship, but rather they become active in this regard when the decline of a relationship presents the need to find new suppliers. This goes against the classical economics' perfect information argument (i.e. agents are aware of their options), fitting instead with the concept of bounded rationality (i.e. agents remain imperfectly informed until need compels them to act). The decline phase is marked by a process of relational unravelling.

Furthermore, Jap and Anderson (2007) find that the overwhelming majority of relationship properties are at a lower point in this stage than during any other. This pronounced difference may be caused by the many crucial differences that exist with the progression of the relationship (i.e. exploration, build-up, maturity, and decline). Two parties are needed to forge a relationship, but it only takes one party to bring it to a halt. Progression in a relationship entails the building of a shared history, whereas a relationship breakdown involves the management of that shared history's effects. Building takes place against the backdrop of a shared context, and is collaborative, involved, and broadly transparent.

Daugherty et al. (2006) find that firms involved in collaborative relationships achieve improved visibility, higher service levels, increased flexibility, greater end-customer satisfaction, and reduced cycle times. However, firms are struggling to achieve optimum levels of collaboration and benefits due to critical details such as selecting the right partner, matching inter-organisational needs and capabilities, and clearly defining standards and goals that are often overlooked (ibid.). Many studies suggest that collaborative relationships are associated with improved performance (Dwyer et al. 1987; Heide and John, 1990; Ganesan, 1994; Kalwani and Narayandas, 1995; Doney and Cannon, 1997; Monczka et al. 1998; Cannon and Perreault, 1999; Rokkan et al. 2003).

A number of other benefits have been identified including: new product development; supplier co-design which can increase quality and knowledge; shorter time to market and more innovative solutions (Kamath and Liker, 1994;); inter-firm learning (Dyer and

Singh, 1998; Okada, 2004); learning networks (Chaston and Mangles, 2000); learning in alliances (Larsson et al. 1998); supply chain learning (Bessant et al. 2003) and supplier development (Dyer and Noebecka, 2000; Rhodes and Carter, 2003; Sako, 2004).

Partnerships provide opportunities for learning; for instance, March (1999) suggests exploitive and explorative learning: exploitive learning involves the development of existing knowledge including: “refinement, routinization, production and implementation” (i.e. improved quality, shorter lead-time, more efficient manufacturing). On the other hand, explorative learning includes innovation and new discoveries: “that involve variation, risk taking, experimentation” (dealing with more innovative processes and products). The balance between exploitive and explorative learning is not always the same in all relationships.

Sobrero and Roberts (2002) explain how commodity supplier expectations focus on cost and differ from the expectations of a strategic supplier. Chaston and Mangles (2000) mention how the supplier manufacturing standard components and competing mainly on price need to be focused on assimilating existing knowledge (i.e. “exploitive learning”). However, Primo and Amundson (2002) have shown how supplier integration can also slow down the development (time) of projects; further, that recruiting new suppliers can foster innovation. It is argued that supplier involvement is more advantageous when designing more complex processes and products.

Prevailing research has analysed the impact of socio-psychological and structural facets of partnerships to gain a better understanding of the performance of alliances (Aulakh et al. 1996). Interactive theorists pay attention to the: “pattern of interaction that facilitates and allows for the effective functioning of the alliance on a day-to-day basis” (Heide and Miner, 1992). “Structural features” provides an area of research which has analysed the ex-ante features of alliances, including the reasons why firms enter into alliances and the criteria used for partner selection (Hagedoom, 1993).

Further research has shown that effective alliances are dependent on the selection of appropriate partners, where choosing partners that own necessary resources and who share similar economic and strategic goals is a critical determinant of alliance formation success (Sarkar et al., 2001). Supplementing the structural approach, there have been studies on the various socio-psychological factors that help build relationship capital (Cullen et al., 2000); further, relationship capital enables the alliance to develop potential value into actual collaborative economic rents (Madhok and Tallman, 1998). It is

important to consider the socio-psychological dimensions that highlight behavioural issues that are key to developing and maintaining relationships (Bradach and Eccles, 1989; Johnson et al. 1996).

Research has shown there is an association between the structural facets of partners, e.g. variety in resource profiles and social compatibility, and the socio-psychological factors, for instance, relationship capital, and have suggested there is a positive relationship between the two (Heide, 1994; Johnson et al. 2004) which affects the performance of an alliance both directly and indirectly.

Parkhe's (1991) explores the connection between interfirm diversity and alliance performance through the conceptualisation of interfirm diversity including: i. Type 1 diversity (complementary resources and capability profiles) and, ii. type 2 diversity (social dimensions). Type 1 diversity includes differences between the alliance partners in terms of resources, capabilities and skills that generate value in an alliance. Type 2 diversity relates to the social and cultural differences between the alliance partners, where differences between partners can have a negative effect on the quality of interaction between the alliance partners and hamper the combination and transformation of divergent pools of tacit knowledge into value for the alliance (Parkhe, 1991).

Resource interdependence and social compatibility between alliance partners has been demonstrated to facilitate the achievement of joint goal and objectives (Parkhe, 1991; Aulakh et al. 1996). Research on strategic alliances has shown that they are able to provide each organisation with the opportunity to enhance organisational learning (Kogut and Zander, 1992).

For all alliances, the first stages are most crucial as this requires the careful selection of potential alliance partners (Hitt et al. 2008). Firms that favour one alliance partner over another may do so due to the value that their combined resource sets can generate. Moreover, having access to complementary resources enables a firm to create novel innovations and sustain competitive advantage.

It is of rare occurrence that firms have sufficient internal resources to maintain competitive advantage (Sirmon et al. 2011). Thus, it is important for firms to analyse potential partners based on the level of resource complementarity before entering an alliance. Furthermore, once an alliance has been formed, the relationship between partners must be sustained and managed in a way that allows for further value generation from resource pools.

When the competitive rivalry in a market is high, it is likely that firms face high levels of uncertainty. To deal with high levels of uncertainty, firms require continuous change and dynamic managerial capabilities (Adner and Helfat, 2003). Often in markets of high competitive rivalry, firms need to maintain competitive advantage by introducing new capabilities and innovations rather than incremental improvements. If firms are not able to develop novel innovations internally, they may have to gain access to such complementary resources through strategic alliances (Harrison et al. 2001). Previous research that has reported on relationship dynamics and relationship life-cycle theory can be found in Appendix 1.

2.5 Relationship characteristics

2.5.1 Compatibility

Compatibilities between businesses have been discussed extensively in the supply chain management literature. “Compatibility gives match quality through similarities—capabilities can be combined to create value because they are similar or share a standard interface” (Mitsubishi and Greeve, 2009: 977). Compatibilities in products, markets and technologies between two firms can be referred to as the level of business relatedness (Koh and Venkatramen, 1991). Studies have found that those alliance partners with similar skills sets and capabilities may be the subject of exploitation rather than exploration (Madhok, 1995).

It has been found that compatibility in organisational cultures and capabilities between alliance partners influences the ability to realise the synergistic¹ potential of an alliance (Madhok and Tallman, 1998). Moreover, compatibility in culture and capabilities may provide an initial idea of potential benefits for partners; however, the real value in the alliance is generated through a dynamic process of interaction and integration. During this process partners can assess the other’s resource in order to plan to move from market-based exchanges toward a more collaborative relationship (Koza and Lewin, 1998).

Similarities in values and objectives of partners have been found to lower coordination costs and provide expectation management and behavioural control (Chung and Kim 2002). Where suppliers are seen to be helpful and friendly, unique and flexible by their

¹ In operations and supply chain management synergy means “cooperation,” and also *sunergos*, meaning (“*working together*”) is the combined working together of two or more parts of a system so that the combined effect is greater than the sum of the efforts of the parts. In operations, the term describes a hoped-for or real positive effect resulting from different individuals, departments, or companies working together and stimulating new ideas that result in greater productivity (Madhook and Tallman, 1998).

counterparts the more likely they are to have relational ties and emotional connections which increases the likelihood of a committed longer-term relationship (Claus and Tangpong, 2018). Evans (1963) proposes a “similarity” hypothesis which posits that the degree of similarity in an alliance is positively associated with favourable relationship outcomes. When a partnership shares similar values and bonds, the relationship becomes more stable and results in greater levels of tolerance through a “social glue” (that helps) to tide over temporary periods of disequilibrium” (Madhok, 1995:121). When alliance partners do not share the same values, goals, and cultures, the alliance can fall into a vicious circle of mistrust and conflict. However, Holtgrave et al. (2019) found that if top managers have trust in their suppliers’ competence and goodwill, they are more likely to cooperate in the face of conflict.

Incompatibility in a relationship can be down to the partners’ inability to develop a harmonious relationship, thereby hampering partners’ collaboration effectiveness (Sarkar et al. 1997). An example of the impact of incompatibilities is seen where culture clash has caused many mergers to fail as the partners are unable to work together seamlessly (Wilkof et al. 1995). Without sharing similar values, norms, and cultures, it is seen to be particularly problematic to try and mix the cultures to make an alliance succeed as incompatibilities between partners hamper their role socialisation and make it difficult for staff from each organisation to work together (Smith and Barclay, 1997).

Sarkar et al. (2001) studied organisational compatibility across two dimensions, cultural compatibility and operational compatibility, and find that they both positively affect alliance performance. They (ibid.) state that the cultural compatibility refers to: “the congruence in organisational philosophies, goals and values”, whilst operational compatibility relates to the congruence in the partners’ procedural capabilities. Their study explores compatibility using two measurements, namely, “cultural compatibility” and “operational compatibility”. Whilst cultural compatibility refers to the similarity in organisational philosophies, goals, and values, the area of operational compatibility refers to the similarity in the partners’ procedural capabilities.

This doctoral study defines business compatibility as the similarities between partners that create value through combining their values, culture, and routines. Compatibility can help to reduce uncertainty. Uncertainty and market risk define the formation of any relationship (Hamel et al. 1989). To remove uncertainty when initiating a relationship, firms may focus on signals from their potential partners once they feel that their

relationship venture may work. Examples can be seen in the banking industry where partners with similar social status are sought (Podolny, 1994) or in the technology-driven industries where patents are seen as signals of the quality for a firm.

2.5.2 Complementarity

Firms form relationships with new partners when there is complementarity. Complementary resources are not identical, yet they simultaneously “complement” each other (Hitt et al., 2001). Complementary resources allow firms to combine acquired resources with their own resource sets, thereby creating a resource bundle that provides unique and difficult-to-imitate value (Harrison et al., 1991). Virtually inimitable value may be the most important criterion or condition for firms to satisfy in efforts to create competitive advantage (Barney, 2001). Additionally, actions to gain access to complementary resources allow firms to learn new and valuable capabilities (Hitt et al. 2000; Hitt et al. 2001). Other studies have defined complementarity as the degree of similarity on certain organisational variables and the convergence of their economic motivations (Park and Ungson, 1997).

Complementarities have also proven important in strategic relationships. In fact, developing partnerships with firms that have complementary resources is a primary means of creating value with this strategic action. Research shows that both partners seek relationships to gain access to complementary resources (Hitt et al. 2000; Inkpen, 2001). Normally, relationships are established because firms do not have all of the resources necessary to compete effectively in particular markets (or they do so because of the uncertainty and the desire to share the risks).

Unfortunately, poor management contributes to the breakdown of relationships. Business relationships generally provide firms with access to their partner’s resources. As such, firms often search for partners with resources that they lack (Gulati et al. 2000). In support of this conclusion, Stuart et al. (2011) finds that a firm’s resource profile is an important component of the relationship formation process. For example, Stuart’s results show that younger and smaller firms without cutting-edge technologies form alliances with larger firms with leading technologies. Doh (2000) argues that firms without specialized resources search for alliance partners who have them.

This complementarity of resources is a key factor for the development of any alliance, creating mutual interdependency, and “... it facilitates the formation, development, and collaborative effectiveness” of alliances (Parkhe, 1991: 580). The merging of two

companies through a strategic alliance offers opportunities for enhancing resource pools, when the capabilities of an organisation is not sufficient on its own to competitive successfully. Moreover, alliances provide more stability than acquisitions when a high level of uncertainty in the market exists due to alliances providing strategic flexibility and reduced trading risks (Wright et al. 2001).

New interfirm relationships enable partners to access the other firm's resources that they may otherwise lack (Gulati et al. 2000). It has been found that an organisation's resources and capability profile are key factors in the new interfirm relationship formation process (Stuart, 2000), likewise Doh (2000) finds that organisations without specialised resources search for alliance partners who have them.

Hitt et al.'s (2000) study of international interfirm partnerships finds that partners seeking alliance formation need to learn new capabilities. In relationships where partners do rely on each other in terms of their resource sets, this is less likely to result in opportunism. Furthermore, resource interdependence is likely to reduce the chances of opportunism in an alliance where both partners perceive that there is "value" in the relationship (Stump and Heide, 1996). Through developing resource interdependence, alliance partners are more likely to create relationship capital by engaging in faithful acts that increase their dependence to each other. This signals their expectations for relationship continuity and also to committing resources to the relationship whilst maintaining an open dialogue and communication within the partnership. Interfirm relationships deliver opportunities for organisational learning where each partner can gain access to knowledge and new capabilities from their counterpart (Inkpen, 2001). However, the more dependent a supplier or buyer is on their partner, the more likely they are to experience coercive or non-coercive behaviour (Huo et al. 2019).

Firms can form such strong ties among partners whereby tacit knowledge can be transferred through problem solving, mutual interdependence and observations in alliance activities, which are crucial to the development of competitive advantage (Lane and Lubatkin, 1998). These alliances offer prospective firms the chance to gain skills and capabilities that they would not have had if an alliance was not formed. This is often seen as strategic complementary. Complementary resources are a major factor for creating value in an alliance (Madhok and Tallman, 1998). Park and Russo (1996); however, whilst not been able to prove that "integrative joint ventures" (using complementary resources) led to high joint venture failure rate, thus showing that differences in skill sets

facilitate learning between alliance partners. A successful partnership reinforces learning processes reduces the likelihood of knowledge fading rapidly and instead they effectively sustaining it (Powell, 1987).

Extant research has shown that resource complementarity is vital to the success of an alliance (Johnston et al. 2004). Complementarity comprises uniqueness and symmetry; uniqueness is achieved through the mix of valuable resources and symmetry where the similar capabilities provide interdependence between the partners. According to the resource-based view the value of complementarity is dependent on the heterogeneity and imperfect mobility of resource and capabilities (Barney, 1991). There are both static and dynamic outlooks within the resource-based view (RBV) explaining how economic rents are generated and sustained (Lado et al. 1997).

The static view can be illustrated by Barney's (1991) argument that complementarity resources need to be rare, inimitable, valuable, and non-substitutional for competitive advantage, while the dynamic view explains that uncertain and constantly changing environments reduce the rent creating abilities of resources, thus emphasizing flow and the dynamic gathering of capabilities over static resource stocks (Dierickx and Cool, 1989). Moreover, a firm's complementarity resources and capabilities are not always enough to sustain competitive advantage; the resources required may be out of the direct control of the firm in which case an alliance would need to be established. Dyer and Singh (1998) argue that firms forming an alliance to gain access to complementary trans-organisation strategic assets alliances will improve their capabilities through the flow of learning and stock of resources.

The value of complementarity has been studied but not in the OSW sector. Harrison et al. (2001) assessed resource complementarity (and compatibility) by measuring the differences between firm levels of research and development intensity, capital intensity, administrative intensity, and debt intensity. Their study find that resource complementarity was positively associated with performance for all these four variables. Harrison et al. (1991) describe complementarity as the differences in skills between two firms. The main premise of these arguments is that each firm will have specific areas of strength that may compensate for the weaknesses of their potential partner (Harigan, 1985; Lorange and Roos, 1992). Displaying and sharing complementarities, whether these be associated with market knowledge, experience or resources they tend to increase the chances of partners forming relationships, that will directly benefit from them.

There are challenges when operationalizing this definition since the resources and capabilities of firms typically have multiple dimensions (e.g. products, technology, and markets) and multiple levels of analysis. This study defines business complementarity as resources that give competitive advantage to the organisation holding superior resource built up through its various alliances (Barney, 1991). Such resources may include those that are tangible (e.g. products, technology, and processes), and intangible (e.g. market knowledge, technical expertise, and reputation).

2.5.3 Relationship capital

Partnerships forged between firms and suppliers who develop a good partnership quality tend to be many-featured and goal-oriented, with a high cultural compatibility existing between the parties involved. In a partnership based on a collaboration in which risk and reward are shared by both businesses, both partners stand to enjoy long-term strategic and operational benefits (Gaur et al. 2011; Lahiri and Kedia, 2011; Lahiri et al. 2012). Studies have shown that the performance of an alliance is not only based on the direct effects of structural components such as resource complementary and alliance compatibilities, but also by the indirect impacts of specific characteristics that are seen as mediating behavioural variables (Aulakh et al. 1996). These studies have argued and found empirical support for the positive effect that relationship variables have on alliance outcomes and the connection between “partner characteristics” and “relationship capital” (Morgan and Hunt, 1994; Stump and Heide, 1996).

The social components represented in relational capital serve as coordinating mechanisms and determine the quality of a relationship. Furthermore, studies show that competitive advantage is only realised when relationships move from being a transaction-based exchange into a long-term relationship (Dyer and Singh, 1998). Sarkar et al. (2001) categorize relationship capital into three key elements, specifically mutual trust, mutual commitment and information exchange and these differentiate “relationship based” efforts from more “arms-length” approaches (Heide and John, 1992). Saleh et al. (2019) confirm that cultural similarity between buyers and suppliers facilitates communication and knowledge sharing that enhance commitment and build trust in the relationship.

This research also feeds into the comprehension of the role played by interpersonal relations in the development of high-quality inter-organisational relationships. The management literature indicates a growing awareness of the need to consider factors at both individual and organisational levels (House et al. 1995). Certain academics argue

that interpersonal relationships forged across firm boundaries are critical to the development of inter-organisational cooperation and relationship development (Larson, 1992). Others, meanwhile, would argue that organisational strategies and systems are formed by factors extraneous to the relationships between individuals (Williamson, 1991).

In accordance with RV, this investigation will explore how even a stable, well-crafted customer relationship can perform at a significantly higher level, when a trusted party represents the seller, irrespective of the state of the inter-organisational relationship. Due to the vital importance of effective, efficient collaboration with external parties in the functioning of supply chains (Bidault and Salgado, 2001), a great deal of SCP research has been focused on the examination of the nature and roles of key partnership components such as trust, commitment (Johnston et al. 2004), and mutual adaptation (Mukherji and Francis, 2008). One aspect of supply chain partnerships into which little research has been conducted – with a few notable exceptions (Fynes et al. 2004; Fynes et al. 2005) – is how the quality of the partnership, defined as the perceived realisation of anticipated outcomes resulting from interorganisational collaboration, can impact on performance.

A high-quality buyer–supplier partnership with a firm basis in shared trust, collaborative problem solving and integrity in the fulfilment of clearly defined commitments, empowers its members to avoid the need to create complex, lengthy contracts. This is an expensive process which can yield difficult-to-monitor, unenforceable agreements (Fynes et al. 2004, 2005; Zaheer and Venkatraman, 1995). Firms that can call upon high-quality contracts with their suppliers are best placed to respond pragmatically to unexpected changes, to conceptualize and execute effective solutions to organisational problems, and to achieve reductions in monitoring costs; all of which can yield a positive economic impact (Ryu et al. 2007). A firm's supply chain will generally comprise multiple parties (e.g. Harland et al. 2004; Hult et al. 2004), which would suggest a need for empirical research into the nature of partnerships between local firms and their suppliers, and the impact of these partnerships on performance (Cousins and Lawson, 2007; Stuart, 1997).

It is argued by some scholars that the relationship between the various partnership dimensions of exchange partners and overall performance may be contingent on

extraneous variables¹ (Carson et al. 2003; Fynes et al. 2005; Krishnan et al. 2006). For example, Carson et al. (2003) argue that the impact of trust levels on performance in vertical R and D collaborations improves in line with the client's capacity to comprehend the tasks involved. In a similar vein, the findings of Lahiri, Kedia, and Mukherjee (2012) suggest that better buyer–supplier partnership quality can drive improvements in performance when the management quality of the local firm is at a high level. These studies collectively argue that the benefits to be gained from higher levels of partnership quality can increase or diminish, depending on certain conditions. Gaur et al. (2011) suggest that there is a need for identification and greater understanding of the boundary conditions of relational governance.

Research suggests that partnership quality and to a lesser extent relational governance are critical factors in inter-firm collaboration (Dyer and Singh, 1998; Lee, 2001; Lee and Kim, 1999). Awan (2019: 21) study states “relational governance has a key role in ensuring the continuation of relationship as a means to support suppliers, resulting in improvements in social performance and innovation performance.” Tight partnerships based on a foundation of mutual trust and commitment can facilitate reductions in transaction costs (Zaheer et al. 1998), and can positively influence performance outcomes. Dyer and Singh (1998) argue that a firm's critical resources can span the firm's boundaries, and can be held in inter-firm resources and processes.

High partnership quality is a vital prerequisite to the continuity of any stable exchange relationship (Jap and Anderson, 2003). A close relationship between a buyer and a supplier which is firmly based on trust, cooperation and the mutual sharing of risks can deliver beneficial performance effects. Indeed, extant research shows how the quality of inter-organisational relationships can have important performance implications for the interested exchange partners (Gaur et al. 2011; Lee, 2001; Lee and Kim, 1999).

Increased inter-organisational trust, for example, can positively influence firm performance (Gaur et al. 2011; Zaheer et al. 1998). Trusting relationships between exchange partners can obviate the need for traditional governance mechanisms, which can be expensive and difficult to implement. Improved partnership quality between a focal firm and its suppliers can potentially allow the by-passing of formal contracts, which can represent a major financial overhead and drain on human resources for businesses

¹ These are *variables* the influence the outcome of an investigation, though they are not the study variables that are actually of interest.

(Williamson, 1991; Zaheer and Venkatraman, 1995). A close buyer–supplier relationship can also allow the buyer to focus more of their attention on core competencies, without the distraction of monitoring the partner firm for opportunistic behaviour (Williamson, 1985, 1991).

Existing literature suggests that relationships involving a higher partnership quality tend to be associated with the mutual sharing of financial risk, trust, commitment, mutual pragmatism, reciprocity, and resilience (Lahiri and Kedia, 2012; Wu et al. 2006). In one recent study, Lahiri and Kedia (2011: 3) demonstrate how close partnerships of this kind between the focal firm and its suppliers can offer: “... customer satisfaction, enhanced perception of fairness and justice, customer loyalty, relationship satisfaction, repeat transactions and business continuity”. Firms engaging in purely transactional relationships with their suppliers may not enjoy the same benefits. Proponents of the relational capital approach to supplier management argue that close partnerships between a firm and their suppliers can be difficult to replicate due to the effects of partner-specific causal ambiguity (Dyer, 1996; Lado, Dant, and Tekleab, 2008).

Hult et al. (2006) argue that four competitive priorities are crucial to the critical analysis of partnerships, namely: speed, quality, flexibility (Clauss and Tangpong, 2018) and cost. A high-level partnership quality between the focal firm and the supplier will allow good performance in each of these areas for both parties, providing a competitive advantage that would be difficult for a stand-alone partner to match (Cousins and Lawson, 2007). When a relationship is built upon trust and good communication enabling close cooperation to exist between a focal firm and its suppliers, each party can better understand the other’s goals and expectations. This ultimately improves the partnership. Improved supplier performance also serves to improve cycle time and customer order fill rate. If a good relationship exists between the two partners, both are likely to enjoy the performance-enhancing benefits of a familiarity with the other party’s knowledge-base.

The lack of good partnership quality between a firm and its suppliers meanwhile, tends to lead to transactions being conducted at an arm’s-length basis. Transactional relationships of this kind generally fail to provide suppliers with the potential to exceed their regular capacities and offer a higher level of service to the focal firm. Collaborative measures to encourage on-time deliveries and a higher product quality from the supplier tend to facilitate long-term improvements in performance, and this could also confer

benefits onto the end-user, who may experience increased delivery performance and product quality. This results in increased customer satisfaction.

Existing studies into the relationship of partnership quality with performance support this argument. For instance, Narasimhan and Jayaram (1998) suggest that the higher the quality of a buyer–supplier partnership, the better its operational performance will be. Krause, Handfield, and Scannell’s (1998) research into reactive and strategic supplier development, meanwhile, suggests that a strategic focus on supplier development can yield a number of operational benefits including reduced order cycle times, higher product, and service quality levels and improved delivery reliability. Furthermore, embedded relationships in which trust, the open sharing of detailed information and joint approaches to problem-solving can hold numerous advantages over purely transactional relationships, including increased adaptability, improved capacity for coordinated solutions to organisational problems, lower monitoring costs, and better economic results (Dyer, 1996; Dyer and Chu, 2003).

2.5.4 Trust

Interfirm trust has been argued to be a critical element of economic exchange (Ring, 1996) and necessary for the development of sustainable alliances (Johnston et al. 2004). Trust is considered a major factor in the success of inter-organisational relationship development and it is viewed as a central organising construct (McEvily et al. 2003; Michalski et al. 2019). A significant body of research suggests that trust builds slowly in inter-organisational relationships and that it develops out of experience; however, it is argued by some authors that trust can also be developed quickly and easily (Ghoshal and Moran, 1996) or it can be very high from the beginning of a relationship (McKnight et al. 1998). High levels of trust within an alliance help parties to become more willing to take risks on the other’s behalf.

In their study of the dark sides of inter-organisational relationships, Soda and Usai (1999) find that there are issues associated with close inter-organisational relationships; for example, opportunism can start to prevail between partners or they may refrain from healthy competitive practice. RV theory also find that if both partners of a relationship do not mutually benefit from it then there can be concerns over equity and this also can ruin the relationship. Mellewigt et al. (2019) suggest low opportunism cannot be achieved through relational governance mechanisms in isolation but through a combination of relational governance mechanisms and formal contracts that are coordinated and

monitored. Villena et al. (2019) found that the negative and positive effects of trust become more pronounced when environmental uncertainty surrounding buyers is low.

Much extant literature has identified the many ways in which mutual trust has a positive impact on inter-organisational relationships. Mutual trust enables firms to reduce opportunistic behaviour (Bradach and Eccles, 1989) in an alliance as “behavioural repertoires are biased toward cooperation” (Hill, 1990: 511) which guides a shift of the partners towards longer-term collaboration efforts. Trust has been found to have implications for the governance of inter-organisational relationships; for example, hierarchical governance can be substituted by mutual trust (Dwyer et al. 1989).

Trust can also aid bilateral governance through joint endeavours, shared beliefs and mutual concern (Heide, 1994). Mai Anh et al. (2018) suggest that when a supplier trusts the buyer information exchange, joint decision making and benefit/risk sharing can be increased, leading to radical innovations. It has been recognised to deliver cost reductions and has value enhancing properties (Madhok, 1995). Trust has also been found to have implications for market performance and the efficiency of organisations (Bleeke and Ernst, 1991); for example, mutual trust reduces monitoring costs and it allows alliance partners to pool their array of different resources and capabilities effectively (Dwyer and Singh, 1998). Higher levels of trust have been linked to more shared activities between the buyer and supplier, as compared to a more transactional relationship (Martins et al. 2018).

Trust is the fundamental building block of buyer–supplier relationships and is included in most relationship models. Dwyer et al. (1987) define trust as: “a party’s expectation that another party desires coordination will fulfil obligations and will pull its weight in the relationship”. Corsten and Kumar (2005) posit that trust results in greater openness between suppliers and retailers and thus greater knowledge and appreciation of each other’s contribution to the relationship.

Nyaga et al.’s (2010) study finds that trust has a significantly greater impact on commitment and satisfaction with the relationship for buyers than for suppliers. They also find that antecedents of trust such as information sharing are most important to suppliers, while the outcomes of trust (e.g. satisfaction and performance) are most important to buyers. However, Dwyer et al. (1987) and Jap and Anderson (2007) agree that relational characteristics such as trust and goal congruence develop in a similar way throughout the relationship and gradually evolve. Kaufmann et al. (2018) study preventing initial trust

loss and (prebreach) and promoting subsequent trust repair (post breach) through interorganisational and interpersonal relationships suggesting interorganisational trust repair helps turn a once adversarial relationship to a collaborative relationship. Furthermore, initial interpersonal ties can help avoid initial trust loss whilst adversarial interpersonal ties intensify the extent of interorganisational trust loss.

On the other hand, Ring Van de Ven (1994) suggests that the differences in the speed of relational development originate from uncertainty and the reliance of trust amongst parties during the life-cycle of the relationship. Therefore, managers need to emphasize activities that build trust. While trust building actions may be more difficult for suppliers to demonstrate (McCutcheon and Stuart, 2000), there is need for both buyers and suppliers to continuously look for such opportunities. However, using trust as a variable does not always offer a predictable outcome; Anderson and Narus (1990: 54) comment: "... when asked about their perceptions of their firm's trust in a working relationship, informants give a present state report; that is, they answer on how much their firm trusts the partner's firm at the current point in time". Thus, it is important to account for time when using trust as a variable in relationship research. For example, Morgan and Hunt (1994) study focuses specifically on two relational constructs: "trust" and "commitment"; however, they use only the customer's perceived level of these constructs to capture the current state of an exchange.

There are limitations of such a static perspective as Grayson and Ambler (1999: 139) note: "... that the length of the relationship changes, the nature of the associations between relational constructs," and "the exact nature of these relational dynamics remains elusive". Dwyer et al. (1987) argue that trust removes the need to cover all contingencies in a formal contract for sustained commitment. For instance, informal communication in the form of trust is seen as a mechanism to hedge against incomplete contracts. They state that relational mechanisms should be present in an inter-organisational relationship to the extent that they reduce opportunism, which does not imply that formal and informal mechanisms should be in balance in a relationship as suggested by Ring and Van de Ven (1994).

2.5.5 Previous ties/path dependence

It is noted that history regulates the potential performance of inter-firm relationships by influencing how partners perceive relationship dynamics, structure the performance of the relationship and set time horizons (Grewel and Dharwadkar, 2002). Relationship

history is said to be a hard-won asset where firms that have had a troubled past are more likely to try and renew the relationship rather than start a new one, which corresponds with RV theory. Previous ties and experience between partners can strongly influence the present performance of an alliance (Nelson, 1995).

It is commonly found that firms tend to prefer to renew existing relationships rather than start new ones as there are potentially more risks in establishing the relationship. DSO theory takes a contrasting view that when firms have experienced a troubled relationship, they are much more likely to abandon rather than revive it; for example, “they move toward the commitment phase or dissolve it along the way” (Cannon and Perreault, 1999, p.456).

DSO theory states that regression, i.e. when a relationship moves backwards one stage, is possible, when a relationship moves from “expansion” back to the “exploration” stage; however, when a relationship reverses from a committed stage to expansion there are likely to be psychological scars and conflict regarding the high costs involved in reviving the relationship. Existing research considers the path dependence of relational development patterns across the relationship life-cycle phases (Jap and Anderson, 2007).

To address this subject, it compares the progress paths through the life-cycle (as prescribed by DSO) with “aberrant” patterns (renewal, saving, and reconsideration), and consider how the paths which lead to a life-cycle stage could affect inter-organisational outcomes, exerting an influence extraneous to and simultaneously with the current relationship stage. Jap and Anderson (2007) find that relationships which follow DSO’s predicted progression through the life-cycle phases are positively related to performance.

2.5.6 Governance

During the formation of an alliance, the partners’ governance structures are especially important in order to provide the right incentives to ensure that the alliance can deliver ongoing innovative improvements (Zahra et al. 2009). During each stage of the relationship, “life-cycle” resource orchestration actions are vital to alliance success and must be emphasized in different ways depending on the stage of relationship development. Thus, in specific stages of relationship development, differing resource orchestration processes are required. For example, the resources available to a firm in the expansion stage can differ from the resources needed in the maturity/growth stage; this stresses the need for management understanding of how best to orchestrate resources depending on relationship stage to create value in the alliance.

Furthermore, while a manager may be responsible for a set of resources in the exploration stage, they may no longer have responsibility for these resources once the relationship moves to the expansion stage. The movement from one stage to another may also have an impact on the governance structures in place at each stage; new structures as well as incentives may need to be developed to maintain alliance performance. This is particularly important when considering how managers structure relationships with alliance partners; the dynamics involved between managers when a relationship is moving from one stage to the next can provide insights on how a firm's operation and governance structures affect firm performance.

Another area in which life-cycle literature can be improved is how life-cycle stages are linked with managerial depth. For example, research could provide insights into how governance structures change depending on what development stage the alliance is in; more specifically, what type of information flows are required and how communication between managerial levels may change as the firm progresses through its life-cycle. Sirmon et al. (2011) suggest: "... how managers address internal communications in each stage may dictate the richness of information that can be used to structure, bundle, and eventually leverage the firm's resources to develop competitive advantages".

2.5.7 Commitment

Commitment has been described as the "enduring desire to maintain a relationship" (Moorman et al., 1993: 316). Partners that are committed to a relationship take on a long-term orientation where they ignore the opportunity to work with alternative partners or take up short term opportunities in favour of reinforcing the continuing relationship (Dwyer et al. 1987). When organisations signal to their partners the willingness to work together over the long term, it is more likely that partners will make relationship-specific investments, not only to enhance the level of commitment shown to their partner but also to increase the value and competitiveness generated in the alliance (Anderson and Weitz, 1992). Commitment has been conceptualized by Sarkar et al. (2001) as "the degree to which both parties are willing to invest requisite resources into the alliance". Furthermore, Anderson and Weitz (1992) define commitment as the: "desire to develop a stable relationship, a willingness to make short-term sacrifices to maintain the relationship and the confidence in the stability of the relationship".

Morgan and Hunt (1994) define commitment as: "an exchange partner believing that an ongoing relationship is so important as to warrant maximum efforts at maintaining it".

Commitment results in mutual gain for both suppliers and buyers in a supply chain relationship (Anderson and Weitz, 1992), where performance improvements are often made possible when firms commit to long-term partnerships (Krause et al., 2007). Prahinski and Benton (2004) discover that commitment has a direct and positive impact on performance, whilst Jap and Ganesan (2000) find that retailers' perceptions of their suppliers' commitment influenced the retailers' evaluation of supplier performance and their satisfaction.

Nyaga et al.'s (2010) study finds that buyer commitment seems to be driven mainly by intangible attributes (e.g. trust) while supplier commitment seems to be driven more by tangible attributes (e.g. information sharing); however, suppliers in Nyaga et al.'s (2010) study explain how commitment does not necessarily lead to improved performance. Even if they have a trusting relationship with the buyer it boils down to "pay off", where buyers may look for alternative suppliers if expectations about price, performance, or service are not met. Thus, while trust leads to greater commitment, the impact is greater for buyers than for suppliers. Clauss and Tangpong (2018) suggest buyer commitment is driven by four primary supplier attributes, namely, flexibility, helpfulness, uniqueness and helpfulness – these help suppliers build relational ties with their buyer and forge a more committed long-term relationship.

Gundlach et al. (1995) acknowledge three types of commitment, which they explain are crucial in the development of any alliance relationship, denoted as instrumental, affective and temporal dimensions. Instrumental commitment is defined by Gundlach et al. (1995) as: "... affirmative actions taken by a party that creates a degree of self interest in the relationship". Affective commitment is defined as: "... an affective attachment to the goals and values of an organisation, the role one plays in relation to those goals and values, and to the organisation for its own sake, which should be considered separately from the relationship's instrumental worth".

Lastly, temporal commitment has been described by Moorman and Zaltman (1992) as the intention to maintain a valued relationship in the future, bearing in mind the durability and consistency over time as suggested by Dwyer et al. (1987). Research has shown that the efficient communication of information between alliance partners increases commitment; further, when dependence, trust and communication levels between partners is high, commitment is positively affected (Wu et al. 2004; Coote et al. 2003).

2.5.8 Information exchange

Communication certainly has a crucial role to play in any inter-organisational relationship. Effective communication must be achieved in spite of numerous potential challenges, including cultural differences. Multiple-level communication between organisations may be required by certain partners. For instance, a group of engineers from one firm may be required to work with a group of engineers from a partner firm, over a significant period of time, and one group may have to travel to the other's base in order to do so, necessitating successful communications throughout the process. Information exchange between two partners is vital to the success of an inter-firm relationship; communication helps partners to align their interests, goals and values (Mohr et al. 1996; Whitehead et al. 2019).

The success of an inter-firm relationship is very dependent on the ways in which partners communicate information to one another; it is vital that information is shared between the partners in a timely manner, and that the information needs to be at a specific level of quality (Mohr and Nevin, 1990). Organisations are increasingly dependent on other external organisations knowledge and expertise in order to innovate and improve supply chain performance (Zacharia et al. 2019). The sharing of information in an alliance allows partners to realise the mutual benefits that may be available but also helps reduce any misunderstandings between the partners and removes uncertainty (Dwyer et al. 1987). Sarkar et al. (2001) have conceptualized reciprocal information exchange in relation to formal and informal communication of meaningful and timely information (Anderson and Narus, 1990), whilst Mohr and Spekman (1994) theorize about "collaborative communication" in relation to its quality, extent and participation.

Information sharing has garnered greater research attention in recent years, but most studies have investigated the types of information shared and the gains from sharing (Croson and Donohue, 2006). Furthermore, these studies make the assumption that the institutions sharing information are willing to do so; however, a willingness to share information can be predetermined (where the data to be shared are specified in a contract, with templates used to describe the data format) or spontaneous (where the process is voluntary and non-predetermined). Nyaga et al.'s (2010) research finds that information sharing has a much greater influence on supplier commitment in comparison to buyer commitment. Suppliers are likely to be committed to relationships with buyers who share information since information sharing helps the supplier to provide products or services

more efficiently and effectively. A buyer sharing important information signals their commitment to the supplier, and encourages the supplier to commit to the relationship in return. This is consistent with Whipple et al.'s (2002) research that information sharing does impact buyers and suppliers differently. Information sharing in a supply chain can occur in two ways. It can occur internally, for the effective planning of purchases and company growth, leading to flexibility and coordination and a sense of ownership, and externally, sharing information with supply chain partners to enhance demand planning, physical flows, and financial work processes (Rai et al. 2006). It can also prevent information distortion, resulting in problems such as the "bullwhip effect".

In the supply chain context, a willingness to share information is a trade-off between efficiency and the responsiveness of the information resources. What information is shared often depends on the economics and technology, while the questions of with whom and when require that social involvement be taken into account. Communication between partners improves performance by uncovering points of similarity, aligning goals, resolving problems and providing opportunities for joint value creation, and increasing a customer's revenues or reducing its costs (Mai Anh et al. 2018; Palmatier et al. 2013; Jap and Anderson, 2007; Mohr et al. 1996).

In dynamic environments, accumulated knowledge and established information exchange processes allow partners to be responsive to changing conditions, such that suppliers can continue to create new value for customers and contribute to relationship growth. Otherwise, an inability to exchange knowledge and information causes the relationship to stagnate, problems to fester, and partners to miss opportunities (Ulaga and Eggert, 2006). Joint communication capabilities also allow the customer to leverage the supplier's know-how to improve existing and develop new products, whilst offering effective communication to produce results in timely and cost-efficient ways (Ulaga and Eggert, 2006).

Following this logic, Palmatier et al.'s (2013) study shows how bilateral communication capabilities positively affect commitment velocity because as conditions change (e.g. competitive actions), those exchanges that are better at sharing information are more adaptable, enabling them to identify new opportunities and better avoid conflict, which are critical to sustaining and growing a relationship. It has been argued that communication and the development of norms provide a dynamic basis for the emergence of trust, continued interaction, goal alignment and satisfaction (Dwyer et al. 1987). Min

et al. (2005) find that joint effort, such as planning, goal setting, performance measurement, and problem solving, is essential for successful collaborative relationships, and is closely related to information sharing.

Communication has been found to be a direct corridor for commitment (Coote et al. 2003) where direct effects of relationship characteristics, such as communication quality, have been found to have a positive influence on commitment (de Ruyter et al. 2001). Coote et al. (op. cit.) also find that communication has a positive impact on trust and is also a very important factor to building successful relationship exchange. When coming up with solutions with respect to design issues, it is vital for buyers and suppliers to commit to greater information sharing and especially to be willing to share sensitive design information. Furthermore, when more functions of each of the buyer and supplier firms communicate effectively rather than the traditional sales/purchasing functions, the supplier's quality performance is said to improve drastically (Carter and Miller, 1989).

Information sharing can differ across partners. Whipple et al., (2002) explain how suppliers are more interested in timely information because suppliers rely on information from customers in order to start internal planning processes. On the other hand, buyers are more interested in accurate information because if a problem arises buyers need accurate information to adjust plans properly. It is vital to ensure effective communication between alliance partners as a study by Newman and Rhee (1990) finds that many supplier product problems are due to the lack of effective communication. This is reinforced by Lascelles and Dale's (1990) study which finds that poor communication undermines the buyer's efforts to achieve higher levels of supplier performance.

2.5.9 Uncertainty

In a risk-fraught environment, future events have outcomes of a set probability, i.e. the probability of an event occurring is measurable by a certain probability distribution (Milliken, 1987). The condition of uncertainty, unlike the condition of risk, refers to a difficulty or impossibility in predicting future events (Gaur et al. 2011; Milliken, 1987; Sutcliffe and Zaheer, 1998). It is broadly agreed that risk and uncertainty are generally involved in supply chain relationships (Hult, Christopher, and Ketchen, 2010).

Environmental uncertainty is another factor, alongside risk, which could influence an SCP's partnership quality. "Environmental uncertainty" refers to the potential for a firm's external environment – technology, consumer preference and competitor behaviours – to be characterized by unpredictability, unforeseen change and a lack of pattern (Fynes et

al. 2004). The possibility of unforeseen changes creates a need within firms for to capacity comprehension of and response to environmental changes. Changes within unpredictable environments can take place over a short time-scale, which means firms must be able to rapidly recalibrate their strategies and implement alternative rules of engagement. Environmental uncertainty comprises factors extraneous to the supply chain, whilst supply chain or supply-and-demand risks are inherent within the supply chain. Environmental uncertainty entails factors of a strategic nature, such as product or process technology modifications, changing consumer preferences and so on.

Supply chain risks, meanwhile, are of a largely operational nature. Supply chain risks include demand and lead-time variability, supply time unreliability and order cancellation rate fluctuations. As a result of these attributes, it is generally possible to estimate supply chain risks through probability or likelihood estimation, whilst environmental uncertainty estimates are essentially impossible to calculate. Supply chain risks and environmental uncertainty can cumulatively cause severe disruptions at various points of the supply chain, significantly affecting a firm's ongoing operational capacity, from the accurate fulfilment of customer orders to the successful delivery of crucial services to the end-customer. The negative impact of supply chain risks and environmental uncertainty can also extend to the relationship between a focal firm and its supplier, and the potential of that relationship to provide benefits for the focal firm.

The effectiveness of a strategy for collaboration is defined to some extent by the environmental dynamics which form the context for the exchange partnership (Fynes et al. 2004; Holweg et al. 2005; Krishnan et al. 2006). There are two established opposing viewpoints concerning the impact of environmental uncertainty on exchange relationships. One extreme argues that when faced with considerable uncertainty, firms will cooperate more closely to reduce the risks from an increase in uncertainty (Pfeffer and Salancik, 1978). The opposite school of thought, based on TCE, posits the view that, when faced with uncertainty, firms seek to maximize their flexibility by developing a greater independence from inter-firm relationships (Heide and Miner, 1992).

Extant research suggests that perceived environmental uncertainty significantly influences organisational processes (Sutcliffe and Zaheer, 1998; Williamson, 1985), whilst external, environmental unpredictability has been shown to cause significant information processing demand for companies (Tushman and Nadler, 1978). TCE-based reasoning indicates that uncertain circumstances can present an obstacle to the post-

performance evaluation of the exchange partner, especially where transactions have deviated from the focal firm's expectations (Fynes et al. 2004; Williamson, 1985). Before the event, in an environment in which uncertainty is prevalent, the parties involved in the exchange can find difficulty in forming long-term, trust-based relationships requiring mutual commitment and drafting, high levels of negotiation and the monitoring of complex contracts (Williamson, 2008).

Whilst the literature concerning inter-organisational partnership has been almost unequivocal in heralding the positive effect that higher partnership quality will have on partnership performance (Lahiri and Kedia, 2011), the contingency perspective takes the perspective of the disruptive role of uncertainty on the nature of the relationship between partnership quality and performance. Furthermore, certain academics would argue that excessive closeness in a partnership can also produce negative effects on performance. (Krishnan et al. 2006; McEvily, Perrone and Zaheer, 2003).

This research argues that increased levels of environmental uncertainty can constrict and disrupt the effectiveness of partnership quality as a relational resource, an asset which can improve organisational performance by promoting more effective sharing of knowledge, improved commitment between partners, greater cooperation and reductions in the transaction costs which are generally inherent in the implementation of monitoring mechanisms (Krishnan et al. 2006; Lado et al. 1997). It is proposed that conditions of heightened uncertainty can render these benefits unattainable.

Uncertain conditions necessitate comprehensive and accurate monitoring of the external environment. High partnership quality can potentially involve excessive and often groundless reliance on external data collected by the exchange partners. Due to the limiting effect of uncertainty on a firm's information processing capacity, imprecise or incomplete information can lead to poor decision-making under uncertain conditions. Krishnan et al. (2006: 898) note that certain exchange partners respond to uncertainty with inaction, "culminating in their alliance failing to respond to demands of its environment".

Inter-organisational dependence without a firm basis in diligent checks can also lead to strategic blindness, which restricts capacity for optimal scanning and analysis of the external environment (McEvily et al. 2003). In light of these factors, high levels of uncertainty can be shown to increase the risk of opportunistic partner behaviour and the consequent reduction of value in a transactional relationship's shared resources (Gaur et

al. 2011). Failures to identify pertinent contingencies in an uncertain environment can cause difficulties in the coordination or relationships between a focal firm and its suppliers, which can produce a negative effect on the focal firm's capacity to assess supplier performance (Williamson, 2008).

Environmental uncertainty can cause disruption and distortions in communications and monitoring, and can severely influence the partnership quality-performance relationship as a whole. Stable environments meanwhile, can facilitate improvements in the sharing of information, evaluation of performance and the assessment of mutual objectives between firms – that is to say, lower levels of environmental uncertainty are conducive to better judgement of the external environment by exchange partners, which has a beneficial effect on partnership quality. This research proposes that the positive relationship between partnership quality and supply chain performance will be weaker in instances of higher environmental uncertainty.

Jüttner, Peck, and Christopher (2003: 204) posit a definition of supply chain risks as a "... variation in the distribution of possible supply chain outcomes, their likelihood, and their subjective values". Variations or disruptions of this kind have an effect on inter-organisational flow of information, materials and products. Wagner and Bode (2006) categorize the sources of supply chain risk into five classes: 1. demand side; 2. supply side; 3. regulatory, legal and bureaucratic; 4. infrastructural; and 5. catastrophic. Considering the sources of these categories, they note that "... while the first two risk source categories deal with supply–demand coordination risks that are internal to the supply chain, the latter three focus on risk sources that are not necessarily internal to the chain" (Wagner and Bode, 2006: 310). This doctoral investigation will look at two specific categories of supply chain risk: regulatory and infrastructural; these are the key demand and supply risks considered to be internal to the supply chain. The research will examine the impact of these risks on partnership quality in an SCP relationship.

2.6 Buyer and supplier perceptual differences

Most researchers in the field of buyer–supplier relationships agree that perceptions from both buyers and suppliers should be studied to gain insights into their relationships. It should be noted that measures obtained from one firm in a buyer–supplier relationship do not provide a valid assessment of dyadic relationships. John and Reve (1982) find that buyers' and suppliers' perceptions are highly similar when focused on structural issues, in comparison to more subjective relational issues. Mismatched commitment can result

in dissatisfaction, conflict, opportunistic tendencies, and the ending of the relationship (Anderson and Weitz, 1992; Gundlach et al. 1995). Furthermore, Whipple and Frankel (2000) find that trust is ranked as the most important factor in alliance success by buyers, while their dyadic supplier counterparts rank trust as the second most important factor for success after senior management support.

Calabrese (2000: 61), whose study focuses on automakers, suggests that to improve their supplier base, they should not only focus on: “cost reduction or quality improvement, but they should also involve the suppliers as a whole, starting from the weakest aspects like product and process innovation processes”. McIvor’s (2001: 241) study in the electronic industry reveal how there is close co-operation in product development; however, this is not in respect to price reductions and allocation of benefits between supplier and customer, as the main benefits “were obtained by the customer.”

Most research literature is focused on the buyer perspective while there are relatively few studies made from the perspective of the supplier (Rota et al. 2002; Chung and Kim, 2002; Blomgren, 1997). The need to study the supplier perspective is due to suppliers often being involved in several dynamic supply chains where they supply to numerous customers in different settings. Furthermore, the majority of the literature is focused on organized networks (e.g. supplier associations) or large suppliers using extensive networks made up of many actors and tiers.

Maffin and Braiden (2001) comment that the same frameworks and typologies are not able to be used to analyse small suppliers’ relationships and low volume production. A theme which receives significant attention in articles presenting the view of the supplier (as opposed to the buyer’s view), is the problems experienced by suppliers in a supply network context; and the lack of benefits conferred onto the supplier. Work on these issues includes Peckham et al.’s (2003) study into the contractor’s perspective on partnerships in the construction industry, and Johnsen and Ford (2005)’s study of a first-tier supplier’s perspective on a customer’s supply network in an automotive industry context. My thesis will discuss further positive issues relating to supplier perspectives on working as part of a supply network. Of the relatively few articles addressing this area, there are none found that clearly seek to structure the research field, nor provide any attempt at a classification of relevant issues or perspectives.

When analysing the relationship from the suppliers’ perspective, Stjernstrom and Bengtsson (2004) note that there are demands for price reduction, where high demands

put high pressure on the supplier to lower their costs. This reduces their ability to catch up with technological developments. Vagueness regarding customers' expectations of the supplier can lead to a lack of trust. There could be unequal relations between parties, due to the different degrees of dependence, and this does not provide a beneficial basis for cooperation. Furthermore, there can be imposed restricted opportunities to collaborate with the customers' competitors, in situations where the customer regulates in contracts with the supplier.

This practice so far limits the possibilities for exchanging knowledge between competitors and reduces the customer base needed for cost reductions. A number of studies have investigated the field of buyer–supplier relationships in operations management (Bozarth et al. 1998; Carr and Pearson, 1999; Carter et al. 1996; Hartley et al. 1997; Krause, 1999; Shin et al. 2000; Tan et al. 2002). For instance, Terpend et al. (2008) reviewed 151 empirically based articles on buyer–supplier relationships over 20 years. They find that only six studies had gathered empirical data on both buyer and supplier perspectives. Authors were typically quoting cost or time constraints as the reason for choosing either to focus on the buyer or the supplier (Mohr and Spekman, 1994). Moreover, it has been acknowledged by many authors that there is a lack of dyadic responses in buyer–supplier relationship research (Monczka et al. 1998; O'Toole and Donaldson, 2002; Nidumolu, 1995; Stump and Sriram, 1997). Finally, Forker et al. (1999) collected dyadic data and find that significant differences between the buyers and suppliers are common with respect to their views on relationship development.

2.7 Summary: research gaps and questions

Relationship life-cycle perspectives explicitly show that relationship establishment is a “development process” and that relationships follow a path dependent trajectory (Ring and Van de Ven, 1994: 112), although in a distinct clear-cut sense. It is important to understand the underlying condition as to how and why relationships are formed, particularly under specific contexts such as high uncertainty in nascent industrial sectors and their impact on the relationship development process. Relationship “stages” are used by researchers as epistemological devices to describe differences over time in a continuous process; nevertheless, it is difficult to argue that a relationship changes straightaway at a fixed boundary when it transfers from one stage to the next.

Whilst inter-organisational research has subsided recently, there has not been enough research focus on how relationships evolve over time (Arino and de la Torre, 1998; Jap

and Anderson, 2007), there is a lack of studies on the dynamics of business relationships (Eggert et al. 2006; Wilson, 1995). It is important to note that to date there has been no empirical study providing an integrated and comprehensive explanation as why and how business relationships evolve over time. *Consequently*, the following research question aims to fill this research gap:

- *RQ1: How and why are new inter-firm relationships built in nascent industries with highly uncertain business environments?*

In contrast, "relationship-age" perspectives use age as a continuous proxy for progress through developmental stages (Hibbard et al. 2001; Jap and Anderson, 2007; Lusch and Brown, 1996). The relationship age approach differs from the relationship life-cycle perspective as it assumes that all relationships move through the development cycle at the same rate (i.e. ignoring temporal heterogeneity). Thus, using age as an indicator for relationship development, this implies that all ten-year old relationships are at the same development stage, ignoring any differences in growth rates (Eggert, Ulaga, and Schulz, 2006). Further, relationship can experience a revival or second growth where, for example, a new product is introduced (Ellram, 1991).

A life-cycle view recognises that relationships move through stages at different rates where relationships trajectories are divided into discrete segments. All relationships within one stage embody the same developmental state until they move into the next homogenous state. Research on relational dynamics also addresses a key gap noted by Lewicki et al. (2006: 991), that little attention is paid towards "conceptualising and measuring relationship development over time"; instead, most research "has taken a static 'snapshot' view" of relationships. This thesis studies the impact of relational dynamics on the acceleration or deceleration of a relationship. Due to a lack of research on new interfirm relationship formation, this thesis focuses on relationships in their early stages of development and seeks to identify specific relational triggers and barriers towards relationship development. As a result, the following research question will be answered:

- *RQ2: What are the major triggers and barriers in the early stages of relationship development?*

Buyer supplier relationships can develop through the building of trust and commitment due to specific resource offerings (complementarities) from one party or the other that improve performance. This thesis focuses on the types of complementary resources a supplier or buyer may offer to their partner as well as the types of resources that are valued

from both the supplier and buyer. Furthermore, how these resources can promote further investment in the relationship, speeding up the development process through its initial formation stages and helping the relationship develop into a longer-term alliance. In this sense, the following research question was formulated:

- *RQ3: How are complementary resources valued by buyers and suppliers such that they are willing to invest in new relationship formation?*

There is a lack of research on the effect of compatibility on new inter-firm relationship development. This thesis examines how compatibilities in culture, values, product/process innovations can increase the levels of trust, information exchange and commitment, speeding up relationship development. On the other hand, it is important to understand how relationships can stall due to incompatibilities, and how these incompatibilities can be overcome by one party or the other in order to build trust and commitment, moving a relationship beyond its initial stages of development. Therefore, it is important to answer the following research question:

- *RQ4: What are the major issues related to compatibility and how are incompatibilities overcome?*

This chapter reviewed the key relationship management and life-cycle theories and the associated categories, constructs and characteristics. This literature was critically interrogated to build a framework (figure 2) that is theoretically grounded in relationship evolution from the development of social capital and related resource-based constructs (Barney, 1991). The evolution from transactional to relational exchange was clearly identified. To clarify, this chapter was structured to show the key theories discussing the formation, development and evolution of relationships in nascent and uncertain industrial market contexts. There are limitations with both theories (i.e. they tend to be over positive, emerging in stable environments, time and cost enablers are favourable to collaborative relational development) as well as less positive and darker sides to relational development that are not considered by the literature. In spite of these limitations from a critical review of the literature a conceptual framework with associated categories was developed to guide the development of case studies. Case studies were theoretically informed and chosen to advance the framework and to provide a theoretical contribution to key relational drivers and constructs in the framework. It is anticipated theoretically that the work will contribute to relationship management and life-cycle theory in supply

chain contexts at the dyadic level. The next chapter will discuss the methodological approach guiding this doctoral research investigation.

3. RESEARCH APPROACH

3.1 Overview

In this chapter, the methodological approach guiding this doctoral research investigation is outlined. Furthermore, the methods of data collection are presented, along with the protocols enabling reliability, validity and data robustness. As well as justifying the research method and choice of cases, the details of participants interviewed are presented including what checks were implemented to ensure they were suitably informed to participate in the study. Finally, the limitations as well as practical restrictions to such an investigation are presented. The chapter begins by exploring the philosophical issues of building research in operations and supply chain management. Following a review of key literature, the purpose of this chapter is:

1. To detail the research strategy adopted, including the population and sampling procedure, the data collection process, and the data analysis techniques used.
2. To discuss the methodological challenges faced in each design method, and the steps taken to resolve them.
3. To determine the degree of research quality by applying three tests: construct validity, external validity and reliability.
4. To outline the measures taken to ensure an acceptable response in the face to face, longitudinal interviews conducted.

3.2 Research Strategy

There is a growing need for case studies in business and management research. In comparison with traditional forms of business research, it is important to recognise that case studies are concerned with exploration and explanation rather than prediction (Yin, 1984).

Yin states:

Case study research is one but of several ways of doing social science research. Each strategy has peculiar advantages and disadvantages, depending upon three questions; 1) the type of research question; 2) the control an investigator has over actual behavioural events; and 3) the focus on contemporary as opposed to historical phenomena. (1984: 13)

3.3 Philosophical issues

In making a case for a priori philosophical considerations in research designs Scott (2005: 2) reasons that “to argue against the need to foreground philosophical concerns is to suggest that the issues of validity, reliability and truthfulness should not be central to the work of the researcher.” He shares this view with many other scholars who believe that philosophical issues underpin the methodological decisions that are made even if they are not explicitly acknowledged. Indeed, in the context of supply chain management, it has been argued by Solem (2003) that the philosophy of science adopted for studying plays a significant role on the research questions posed, the research strategy adopted and the methods and reasoning approaches used.

3.3.1 Interpretivism vs. Positivism Juxtaposed

The research methods literature apportions different strategies to executing research works. As suggested above, these approaches are normally underpinned by an assortment of philosophical thoughts. Scholars most persistently, for better or worse, distinguish between qualitative and quantitative research approaches. Qualitative approaches are generally allied to the interpretivist school of thought (Howe, 1988; Ponterotto, 2005). The distinguishing features that set different philosophical thoughts apart are related to how the world is viewed (ontology) and the manner by which this world can be understood (epistemology). An interpretivist ontology rests on the assumption that human beings do not passively react to an external reality but, rather, impose their internal perceptions and ideals on the external world and, in so doing, actively create their realities (Morgan and Smircich, 1980; Suddaby, 2006). Reality in this case, in comparison to the empiricist (or realist) ontology, is not objective and exterior, but is socially constructed (Easterby-Smith et al. 2008), culturally embedded and given meaning by people. Consequently, the interpretivists believe that knowledge is tied to the individual, largely tacit in nature, context specific, subjective and contestable.

This epistemological position given, the qualitative research approach is tasked with appreciating the different constructions and meanings that people place upon their experience (ibid). The focus is on achieving an in-depth understanding of a situation (Cooper and Schindler, 2008), as Tucker et al. (1995: 384) put it a qualitative research focuses on the “context of discovery rather than the context of justification.” Qualitative research is associated with inductive reasoning; the researcher seeks to understand naturally occurring phenomena in their naturally occurring states (ibid). The objects of

description are unfolding social processes rather than the social structures that are often the focus of quantitative research (Van Maanen, 1979). Thus, in order to proceed with research into the social world which is informed by epistemological principles of this kind, Bryman (1984) argues, “research methods are necessary which facilitate an inside view.” Methods associated with the interpretivist paradigm include focus groups, unstructured interviews, textual analysis and ethnographic case studies (McEvoy and Richards, 2006).

Quantitative approaches on the other hand are underpinned by the positivist philosophy. Contrary to interpretivist’s attachment with the social actor’s meaning making prowess, positivism stresses experience as the preeminent source of knowledge. It emphasises a reality which is independent and external of the mind. This belief relies on the existence of reliable knowledge about the world, knowledge that we, as humans, strive to gain (Jonassen, 1991). This ontological perspective leads to an epistemological assumption that knowledge is only significant if it is based on observations of this external reality (Easterby-Smith et al. 2008). Emerging from this objectivist stance is a view of knowledge not as a construction of the social actors but rather as the truth. In essence, the positivists claim that knowledge can be proven to be true as long as this knowledge can be established by systematically observing and measuring quantifiable objects or phenomenon that affect objects (Indick, 2002). Consequently, knowledge can be understood as a context free entity that can be codified.

Whereas qualitative research concerns mostly with theory building, the overall purpose of quantitative research is to explain, and to be able to predict the relationship between or the invariant succession of objects and events (Smith, 1983). Quantitative research is commonly associated with deductive thinking. The task of deduction is to test a theory by deducing one or more hypotheses from it (Blaikie, 2007). The investigator and investigated are independent entities therefore, the investigator is capable of studying a phenomenon without influencing it or being influenced by it (Sale et al. 2002). The quantitative researcher is preoccupied with developing law-like principles that can be generalised (Bell and Bryman, 2007) across different contexts. Surveys are seen as instruments for the elucidation of research which makes such positivist epistemological assumptions (Bryman, 1984), though structured interviews, randomised controlled trials, systematic reviews, statistical analysis of official data (McEvoy and Richards, 2006) and experimental designs (Lee, 1992) are also often recognised as exhibiting the same underlying philosophical premises.

3.3.2 Critical Realism and Case Study Approach

Critical realism is rapidly emerging as a viable paradigmatic alternative for conducting social science research (Wynn Jr and Williams, 2012). As a school of thought, it is a fairly contemporary if not provocative philosophical position and owes much of its celebrated status to philosopher and thinker Roy Bhaskar (Bhaskar, 1978). It is a philosophy of science that is founded upon a priori or necessary truths about the nature of the world (McEvoy and Richards, 2006). The critical realists, in stark contrast to the positivists, believe that the social world exists as an open and structured system independent of our thoughts and impression. An open system is one where more than one “mechanism” will operate at any one time (Houston, 2001).

The structured reality can be differentiated into three organically related domains: the real, the actual, and the empirical. The real refers to the “intransitive” dimensions of knowledge in which actual structures, causal powers (Downward and Mearman, 2006) and liabilities reside. The actual domain refers to what actually happens when these causal powers and liabilities are activated and produce change (Fairclough, 2005). Causes act “transfactually”, but because society is open, causes, though operating consistently, may not reveal themselves in empirical regularities because of countervailing influences (Downward and Mearman, 2007). Thus the empirical domain is the subset of the real and the actual domains that can be experienced and observed (Fairclough, 2005). This being the case, reality therefore cannot be fully apprehended and must be examined imperfectly and probabilistically (Coyle and Williams, 2000). Therefore as Blaikie (1991: 121) summarises, “this is an epistemology of laws as expressing tendencies of things.”

Notwithstanding, the empirical level is akin to the access point of the transitive dimension (Downward and Mearman, 2007). Knowledge, then, can be viewed as a social product, actively produced by means of antecedent social products albeit on the basis of a continual engagement, or interaction, with its (intransitive) object (Patomäki and Wight, 2000). While critical realism shares with positivism the notion of a mind independent reality, it takes issues with positivistic methodologies on two grounds as highlighted in McEvoy and Richards (2006). In the first instance, it shows their exclusive focus on observable events while failing to take full account of the extent to which these observations are influenced by prior theory. Secondly, it shows the basis that they deal with relationships between the various elements of social systems as though they are ‘cut off’ from external

influences in a “closed system” and fail to take account of the interactions between mechanisms and the contexts in which they occur.

Furthermore, while critical realism acknowledges the value of subjectivity of both researcher and researched (Downward and Finch, 2002) dominant in the interpretivist tradition, they are critical of interpretivists who fail to relate discourses to the underlying social structures (McEvoy and Richards, 2006). For critical realists, therefore, the ultimate goal of research is not to identify generalizable laws (positivism) or to identify the lived experience or beliefs of social actors (interpretivism); it is to develop deeper levels of explanation and understanding (*ibid*). Thus, adequate explanation requires “ontic depth”; that is, moving beyond the immediately postulated level of events and/or texts (Downward and Mearman, 2007). In other words, critical realism wants to get beneath the surface to understand and explain why things are as they are, to hypothesise the structures and mechanisms that shape observable events (Mingers, 2000; 2004).

The logic that underpins critical realism is called “retroduction” (McEvoy and Richards, 2006). Retroduction is not so much a formalised logic of inference as a thought operation that moves between knowledge of one thing to another (Danermark, 2002). It is a mode of analysis in which events are studied with respect to what may have, must have, or could have caused them (McEvoy and Richards, 2006). In critical realism the concept of cause is tied to emergence from the interaction of “human agency” and “structures” (Downward and Mearman, 2007). Thus retroduction of causes requires elaboration of the “innate psychological mechanisms” as well as wider “social mechanisms” that influence people’s action and behaviour (Houston, 2001). However, although advocated as the methodological guidelines for theory creation, Lee (2002) believes that few critical realists have used retroduction for theory construction. This is because, he argues, “retroduction is too undeveloped to be used as a way to identify causal mechanisms and structures from which to construct theories or explanations” (*ibid*: 793). Furthermore, it does not indicate how the causal processes should be delineated and articulated, that is, the analytical and literary form the theory should take (Lee, 2002). While this may be the case on the one hand, on the other there is mounting recognition of the compatibility between critical realism case study research (Easton, 2010; Tsang, 2014). Indeed, according to Easton (2010), abduction (Kovács and Spens, 2007), as espoused by critical realism, is a closely related process which has been suggested as appropriate for case research.

3.3.3 A Critical Realist-Inspired Case Study Approach

Case research has consistently been one of the most powerful research methods in operations and supply chain management, particularly in the development of new theory (Voss et al. 2002). Case studies are a favoured strategy when “how” and “why” questions are required, when the researcher has little control over events, and when the research focuses on contemporary phenomena within real-life context. It is defined as a form of empirical enquiry that “investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident,” and is “preferred in examining contemporary events...when the relevant behaviours cannot be manipulated” (Yin, 1994: 23). Therefore, it provides for a more natural, in-context study of the interplay of multiple factors, such as those shaping the dynamics of buyer-supplier relationships; in a form of natural experiment, as opposed to a laboratory experiment. Scholars have recognised the utility of case research in illuminating complex social phenomena. For example, Benbasat et al. (1987) argue that case research is particularly pertinent when a phenomenon is broad and complex, when a holistic, in-depth investigation is needed, and when a phenomenon cannot be studied outside the context in which it occurs. These descriptions chime well with the nature of the problems this thesis seeks to disentangle, particularly given the dearth of empirical studies that have taken a life-cycle approach to inter-firm relationships under uncertain contextual environment.

Case research uses various philosophical lenses. Distinguishing between explanation and description as the predominant purpose of a study, Craib (1992) provides a useful way to rationalise the employment of critical realism as the underpinning philosophy for a case research. He argues for the importance of explanation in comparison to description noting the increasing emphasis on description; “this concentration on description rather than explanation has grown out of a general scepticism about the possibility of explanations” (Craib, 1992: 26). According to Dobson (2012), the requirement for explanation suggests that there is an underlying truth that is amenable to explanation and suggests a realist stance on the part of the researcher. A critical realist perspective used as a lens for case research would also challenge conventional thinking and assumptions and investigate any hidden agendas that may exist in a particular context (Gorski, 2013). Hidden agendas are more likely to be an issue under uncertain conditions.

The study of buyer-supplier relationship from a critical realist perspective is rare. Ryan et al. (2012) argue critical realism can help to understand business relationships and

networks as developing processes. Based on critical realism, business relationships are regarded as real entities, such that their structures and properties can be observed and theorized, and their progresses can be studied. Adamides et al. (2012: 1) demonstrate how the critical realist approach to research methodology is able to contribute to supply chain research “by providing explanations for specific supply chain and logistics related phenomena.” Whilst, Rotaru et al. (2014) use case study to illustrate the adoption of the theory of swift, even flow.

In their paper, Aastrup and Halldorsson (2008) argue case studies in logistics can be justified from a critical realist perspective. Using critical realism, it is possible to deepen our understanding of the reality of logistics activities and performance by especially revealing how working of generative structures and mechanisms are linked to realities (e.g., actual events and experience) occurring in a logistics system. They argue especially in an inter-organisational setting (buyer-supplier) a more complex level of analysis is required such that a deterministic view on behaviour become handicapped while a critical realist perspective can help better understanding agenda and objectives of different social agents. Whilst, Adamides et al. (2012) study a perishable supply chain using the retroductive reasoning from the critical realist perspective, and demonstrated that the critical realist helps understand the dynamics of supply chain of perishable goods

3.3.4 Linking the Research Questions with Critical Realism

A critical realist inspired case study is appropriate for this thesis as it seeks to explain the dynamics of the buyer-supplier relationships under conditions of uncertainty. The first port of call in the aforementioned statement begins with an examination of the research questions. The relationship between research questions and methodology is well articulated in the literature. For instance, Yin (2013) links research questions to types of research designs. Johnson and Onwuegbuzie (2004) are more pragmatic suggesting that research methods should follow research questions in a way that offers the best chance to obtain useful answers. For the critical realists, the choice of methods should be dictated by the nature of the research problem (McEvoy and Richards, 2006). For instance, accentuating the critical realism position, Olsen and Morgan (2005) suggest that retroduction seeks to find out why events have happened in the way they did? Downward and Mearman (2007) for their part claim that retroduction is useful to address questions such as ‘Why X?’ with an implicit alternative ‘and not Y?’ Lawson (2006) on the other hand argues that more interesting questions are asked in social science of the explicit form

‘Why X rather than Y?’ Therefore, given the epistemological principles of critical realism (Wynn Jr and Williams, 2012; Ryan et al. 2012), Easton (2010: 123) argues that “the [research] question must be of the form ‘What caused the events associated with the phenomenon to occur?’” In the main, causal research questions of the critical realist type seek “to explain how and why specific, complex events occur in a particular context” (Wynn Jr and Williams, 2012: 804). The main research questions are restated below:

- RQ1: How and why are new inter-firm relationships built in nascent industries with highly uncertain business environments?
- RQ2: What are the major triggers and barriers in the early stages of relationship development?
- RQ3: How are complementary resources valued by buyers and suppliers such that they are willing to invest in new relationship formation?
- RQ4: What are the major issues related to compatibility and how are incompatibilities overcome?

An inspection of the research questions and the associated aims reveals that these reflect the logic of retrodution. The first question, when dissected, seeks to illuminate the mechanisms at play in building complex inter-firm relationships under the contextual condition of uncertainty. The other three questions are of the form “What caused the events associated with the phenomenon to occur?” as recommended by Easton (2010). Therefore, it can be concluded that critical realism offers a compatible paradigm to substantively address the nature of the questions posed in this research.

3.3.5 The Emergent Nature of Buyer-Supplier Relationship

A further justification for employing a critical realist case study in this thesis could be provided by unpacking the emergent nature of the buyer-supplier relationship. There is a need for specific research approaches to be applied, such as critical realism, in order to understand the complexity and dynamic changes of inter-firm relationships and their processes, as they develop over time (Ryan et al, 2012: 300). The authors state “Critical realism is well suited to addressing the central questions of structural change and transformation in industrial relationships and networks.”

The unit of analysis in this thesis is taken to be the relationship which can also be viewed as emergent from the specificities of its parts in interaction with the context. This is to suggest that relationships are discriminated on the idiosyncrasies of the buyers and suppliers under the contextual conditions of a given transaction. As discussed above, the

notion of emergence is central to the critical realist philosophy. In addition to being independent of human activities, material entities exist by virtue of internal and necessary relations between constituents which generate their internal and external powers (Archer, 2000). For instance, the power of water to quench a thirst is not a property of either of its constituents in isolation, hydrogen or oxygen, but emerges only as a property of the water molecule, H₂O, as an irreducible whole (Allen et al. 2013).

In a similar relational line of reasoning Archer (2000) argues that social structures such as roles and institutions have associated relations, rights and responsibilities and that certain social positions exist precisely because of their place in a network of relations, carrying with them necessary relations. Putting this reasoning in the context of this thesis, it can be argued that buyers and suppliers are social positions which are necessary and internally related. These positions allow the undertaking of transactions or alternatively assign a greater degree of bargaining power to one constituent and not the other. The rights and responsibilities of buyers and suppliers are variously shaped by norms, be it more formally in the shape of contractual agreements or through relational governance. However, because of bounded rationality and the increasingly uncertain environment in which transactions take place, there are greater opportunities for actors to behave opportunistically. Thus, the dynamics of buyer-supplier relationship are complex phenomena that emerge from interactions between causal mechanisms and contexts that may or may not often reveal themselves in empirical tendencies. Therefore, addressing the research questions entails explaining these underlying mechanisms that influence behaviour in buyer-supplier relationships.

In summary, the decision to adopt a critical realist-inspired case study approach was partly driven by the explanatory nature of the research, and due to the need for rich qualitative information to enable an in-depth understanding of the nature of the relationships between buyers and suppliers that would not otherwise be revealed in empirical tendencies by the use of purely quantitative methods. Thus, to achieve this, a case study methodology was adopted with a view of accessing detailed accounts of suppliers' interactions with buyers and vice versa.

3.4 Research quality

3.4.1 Validity and Reliability of Critical Realist Case Research

The validity and reliability of critical realism-inspired research are increased by triangulating results, using several methods and perspectives (Ellram, 1996). In social

science triangulation is defined as the mixing of data or methods so that diverse viewpoints or standpoints cast light upon a topic (Olsen and Ellram, 1997). Denzin (1970) offers a useful taxonomy distinguishing between: (a) data triangulation; (b) investigator triangulation; (c) theoretical triangulation and (d) methodological triangulation. However, it has been noted that a conflict of paradigms can occur when combining both quantitative and qualitative methods in one research project. Whilst a researcher can take a specific philosophical approach and use the methodology of another approach to reinforce the outcome, Easterby-Smith et al. (2002) propose using data collection methods from one paradigm to avoid any issues.

Critical realism is seen as an underlying philosophy that addresses paradigmatic paradox associated with triangulation. In the critical realist tradition the utility of triangulation is seen in the methodological type (Seale, 1999; McEvoy and Richards, 2003) or as Downward and Mearman (2007) prefers, mixed method triangulation (MMT). Methodological triangulation, as the name suggests, involves the combination of different methods of analysis (Downward and Mearman, 2008). Within-method triangulation occurs when different varieties of the same method are combined (Yeung, 1997).

According to Risjord et al. (2002) methodological triangulation is premised on three rationales: completeness, abductive inspiration, and confirmation. Moreover, McEvoy and Richards (2006) believe that these are equally compatible with a critical realist rationale. Triangulation yields completeness because quantitative methods can further develop findings derived from qualitative research and vice versa (Risjord et al. 2002). Thus, it offers more complete understanding by bringing together the information gained from different perspectives and prompting interrogation of emergent contradictions (Olsen and Ellram, 1997). Given that both quantitative and qualitative methods can be employed to reveal different facets of the same reality and also to examine reality from different perspectives, McEvoy and Richards (2006) conclude that completeness is compatible with a critical realist perspective.

Abductive inspiration is the use of one method to generate ideas that are tested by another (Risjord et al. 2002). It is very similar in meaning to the critical realist concept of retrodution (McEvoy and Richards, 2006). Further, Golicic and Davis (2012: 728) stated “critical realism reconciles the independent, objective nature of the physical world (i.e. realism) with the sensory experiences whereby we know about that world (i.e. critical)”. Indeed Olsen and Morgan (2005) agree that methodological pluralism involving a

combination of quantitative and qualitative methods is central to retrodution. It is purported to produce a more reliable and highly confirmed result than either method could yield alone (Risjord et al. 2002). Hence as Downward and Mearman (2007: 16) puts it, mixed method triangulation adds validity for it “enables a nexus of mutually supportive explained propositions in which the whole stands distinct from its parts.”

The use of triangulation for the purpose of confirmation comes closest to the original use of the term, which describes a set of techniques that are used to locate a fixed position (ibid). This implies that different methods are combined to provide complementary insights into the same empirical phenomenon with the aim of enhancing the validity of representations (Modell, 2009). In realist terms this suggests that this approach can examine convergence on, and tentative confirmation of, a real tendency (Oliver, 2012). McEvoy and Richards (2006) find this approach appealing from a critical realist perspective as it is based on the assumption that there is a tangible social reality. It is triangulation for the purpose of confirmation which is employed in this thesis making use of qualitative interviews, documentary sources and some quantitative data.

Furthermore, by studying participants in their work environment, this study aims for internal validity and relevance to the group participants involved. The study involved supply chain managers into the questionnaire design process to confirm face validity. Collis and Hussey (2003) describe face validity being achieved when the phenomena studied is valid for the research participants themselves. The results should be valid for all suppliers and buyers, while there is emphasis on specific sectors results valuable for all manufacturers forming new relationships in uncertain and nascent industries.

Another common methodological issue in the research addresses the problem of generalisation (e.g. external validity), of findings beyond the present study. For example, if resource complementarity has sped up relationship development for one organisation, are the results equally valid in another organisation? By choosing a multiple case study design in this research, the aim was to generalise a particular set of results to other organisations, while at the same time maintaining some unique features of each organisation.

3.5 Applied research methodology

As mentioned by several researchers, the area of formation of new inter-firm relationships and the effect of compatibility and complementarity on relationship life-cycles is under-

researched (Vanpoucke et al. 2014; Jap, 2001; Sarkar et al. 2001). The proposed research is therefore taking place at an explanatory stage of this research area.

In order to deliver further understanding of how buyer–supplier compatibility and complementarity affect the relationship life-cycle, this research requires knowledge to be extracted from supply chain managers who are involved in relationship development with a new partner. It is therefore important to gain the participants’ perception of the processes and situation, as their decision making is based on that perception.

3.5.1 Operationalising the Case Study Research

For research in business and management topics, especially in the social sciences arena, there are several research methodologies that can be employed. An important factor to consider in the design of case study research is the number of cases the research should incorporate. A set of options for conducting case study research is listed in Table 1 below along with the advantages and disadvantages of each option.

Option	Advantages	Disadvantages
Single cases	Greater depth.	Limits on the generalisability of conclusions drawn. Biases such as misjudging the representativeness of a single event and exaggerating easily available data.
Multiple Cases	Augment external validity, help guard against observer bias.	More resource needed, less depth per case.
Retrospective cases	Allow collection of data on historical events.	May be difficult to determine cause and effect, participants may not recall important events.
Longitudinal cases	Overcome the problems of retrospective cases.	Have long elapsed time and thus may be difficult to do.

Table 3 - Types of cases (Voss et al. 2002: 203)

Given the research objectives, a multiple case study method was selected as being most suitable for this research. A complex phenomenon such as relationship development could be better understood if the context of actions was also studied. Compared to single case studies that provide an in-depth understanding of a particular condition (Walsham, 1995), the multiple case study method allows the analysis of phenomena in diverse settings, permitting cross-case analysis and increasing the generalisability of the findings (Yin, 2013). Furthermore, the research involved a longitudinal approach, which was retrospective, using archival and historical data but and was complemented by real-time data.

During case selection, this research needed to select cases which could provide detailed evidence on each of the framework's categories and constructs. Therefore, they were purposively sampled. They were all newly formed relationships in the early stages of development with high uncertainty due to the nascence of the OSW sector. These sectors provide high variance in the antecedent triggers catalysing relationship development. Other factors guiding the sampling were the high-quality access to data, previous work experience in these sectors, former projects with these firms and a large number of strong network connections built up over time (prior to the doctoral investigation). This research used "theoretical sampling" (Glaser and Strauss, 1967), recommending that cases may be chosen to "replicate previous cases or extend emergent theory", or to "fill theoretical categories and provide examples of polar types" (Eisenhardt, 1989: 537). This is founded on "replication" reasoning for the use of multiple case studies rather than a single case (Bryman, 1988; Yin, 2013).

3.5.2 Case Selection

The three cases including 12 pairs of relationships in total are selected for the following reasons. Two cases involve several dyads in their early stages of development, while one case involves a triad in their early stages of development. Two of the cases are taken from a supplier perspective, whilst one studies the perspective from the buyer's and supplier's side. For most of the cases, one partner is an experienced player in the industry they operate in, while their counterpart is a new entrant in the market, in some cases, both partners are new to the OSW industry. This makes the research more interesting as it enables the researcher to compare the different approaches firms take to relationship development. The cases study the relationship dynamics involved in the formation of new buyer-supplier relationships, in particular, complementarity and compatibility, as this research area is not well researched. The relationship under study involves partners from different industries (steel/OSW) as well as geographic locations, enabling this research to study circumstances where compatibility and complementarity are rare.

The three cases and their associated sets of relationships chosen for this research face highly competitive environments where there is a need for a broad range of suppliers and where firms are forced to press for quality improvements and make supply chain cost reductions. The literature illustrates ample precedent for the case methodology and verifies its applicability in business to business, buyer-supplier relationship, supply chain management, and logistics research (Bonoma, 1985; Ellram, 1996; Johnston et al. 2004;

Meredith, 1998; Perry, 1989). The study has followed a qualitative methodological approach that is guided by Ellram's (2002) case study framework. The framework Ellram (2002) presents illustrates a positivistic approach to case study research; however, this research aims to draw similarities with the chosen methodology. To fulfil the requirements of multiple case study research highlighted by Ellram (2002), three multinational companies in two different industries were chosen. Two of the case studies involve the analysis of relationship development over time from the supplier's perspective, while one case studies relationship development from both buyer and supplier perspectives. The number of cases studied is regarded to be a large sample for a qualitative study. This is justified by the number of interviews undertaken with numerous staff from multiple levels of the company hierarchy, responsible for different interactions and activities with their supply chain partners.

To enhance the applicability and robustness of the findings and gain a deeper understanding of contingent factors, purposeful sampling of multiple cases covering a broad spectrum of industrial activity and diverse set of contexts are selected (Miles and Huberman, 1994; Yin, 1994). Further, the generalisability of my findings is justified by selecting cases from different industries and product categories, following Eisenhardt's (1989) guidelines. An important selection criterion was the ability of the participant from the buyer or supplier firm to describe the relationship trajectory through their in-depth knowledge of the history of the relationship.

Following Ellram (1996) when conducting case study research, multiple case studies should be in the number of six to ten cases. However, a qualitative approach involves an in-depth inquiry into each case; with this in mind, having a large sample size would present challenges of processing such large amounts of data. While it could be possible to provide data from a large sample size, it would mean losing depth and also trackability of the data that would weaken the analysis. Thus, a sufficient number of cases is required in order to compare data within each case and provide suitable conclusions; also, covering a number of different industries increases the validity of this study. Each interview was initially scheduled to last a duration of 60 minutes with an additional 30 minutes considered for the beginning and end of the interview including greetings and winding down of the meeting, as well as other practical considerations.

Case selection started after the researcher attended global OSW conferences and national events promoting OSW development for the UK alongside joining several regional and

governmental bodies associated with UK OSW industrial development. The attendance at numerous networking events, both in the UK and Europe, enabled the researcher to establish a large network of experts across the OSW supply chain. Through these events the researcher was able to gain details of individuals and companies that were key players in the OSW sector, with the potential to provide good data, on industry, organisational and individual levels. The researcher had also applied and won internal university research funds for a short-term local development project with a sea port aiming to serve the OSW market and attract OSW manufacturers and associated supply chain, UK and international. Securing the short-term project with the port enabled the researcher to be introduced to various high-level executives in the OSW industry by attending both private and public events. Personal introductions afforded the researcher access to OSW companies as well as key governmental figures involved in the UK OSW industrial strategy and local councillors. Through these introductions the researcher had a testing bed for the pilot study, with access to a range of OSW experts to test and validate the pilot study.

The research started with convenience sampling based upon the researcher's networks and contacts made during conference attendances and working on the short term funded project. The key participants that were contacted had to fulfil certain requirements such as being directly involved in the development of the relationship with the partner firm. The participants job role was also a criterion for selection where, they would need to hold a position relating to supply chain, operations, logistics, product development or have regular contact with the partner company.

This allowed the researcher to apply a snowball sampling technique to identify and gain access to companies by discussing potential case companies with a number of individuals involved at executive levels in the OSW sector whether company based or in government.

The case companies were selected for the product sector they are operating in (OSW) as well as their significant size, worldwide and multinational presence. The companies selected along with their respective relationships also varied significantly in terms of number of employees and annual turnover. Thus, the methodology requirements of a wide research area were covered.

When deciding on which companies to choose from the researcher cross-checked the company in terms of whether it spanned elements of the conceptual framework. For instance, the case companies selected had to offer certain complementarities in the

relationship they were looking to form, such as, thorough knowledge of the market or technical expertise on a specific product or process, having a strong reputation in OSW or being able to discuss in detail, the personal relationships that existed between the companies. The case companies and respondents were also selected based upon their knowledge of the governance structures within the company and the types of information exchanged between partner companies.

Further variation between the cases included the length and age of the relationship as well as the stage of development. Cases in their early stage of development were chosen where partners would typically be initiating and forming new relationships with strangers; however, cases involving relationships with prior ties were chosen to show variety, but also to examine how companies would reignite old relationships and start new initiatives together. The cases were also chosen for their variety in the products that were being exchanged between partners. For example, for the OSW cases, products would be new products in their prototype stage, whilst the steel industry would involve mature products, but would be introducing new services and product/process developments alongside their products. The case companies were selected as they met the required characteristics of the study.

In each of the cases, the researcher contacted senior members of staff, usually managing directors and supply chain directors, through meeting them at conferences as well as introductions via existing contacts developed during the start of the study. After first contact, the researcher developed a personal relationship with the senior staff members that enabled the researcher to exert significant influence on the selection of participants. In each case access was negotiated with the senior staff members which enabled the identification of relevant staff that would be able to contribute to the research. Primarily, for each case, there would be several members of staff spanning multiple levels of the company hierarchy that would be suggested to the researcher, who would be involved in a specific relationship with a specific partner firm.

The senior level members of the case companies were keen to grant access to the researcher, as they were interested in the issues of developing successful, long-term relationships with their prospective partners. They were also keen to understand how they could reignite existing relationships that had fallen into decline. The staff members wanted to take part in the research to discuss and identify the challenges faced when setting up joint initiatives with new supply chain partners, and further, to work with the

researcher to identify solutions as well as record major events in the development of their relationship with a specific partner. Access was negotiated with several staff in each organisation to be undertaken over a period of three years initially, but extendable if necessary. It was negotiated that access to the company was granted based on strict anonymity with non-disclosure agreements put in place, which facilitated open and frank dialogue with the participants.

The study primarily focuses on suppliers and buyers based in the UK and their relationships with supply chain partners, both in the UK and overseas. Considering Ellram's (2002) multiple case study framework, a total of three case companies were chosen; two of the cases involve relationship development from the supplier's perspective, while the other case (triad) is from the buyer's and supplier's perspective. All three of the cases primarily operate in the OSW sector. In each case, the focal company's relationship with multiple supply chain partners is studied. Most of the cases were chosen due to their involvement in the OSW sector, a sector which is not well investigated due to its nascence, and therefore presents opportunities to provide new insights in relationship development and advance supply chain research. Two of the cases involve suppliers in the OSW sector who primarily operate in the steel sector, a mature sector. These cases enable the researcher to provide insights into the steel sector and variability into how supply chain relationships develop in different sectors with differing levels of maturity.

The research involves three longitudinal case studies (table 2 below) (12 pairs of supplier-buyer relationships) of two OSW suppliers and one OSW buyer/supplier, and their relationships with new partners under a highly uncertain market and political context. One supplier/buyer (MOCO) manufactures gearbox applications that are supplied to OSW OEMs who manufacture wind turbines. MOCO is also studied as a buyer case where they have several relationships with suppliers of components for their gearboxes (figure 3). The second focal firm supplier is a major structural steel producer (TACO), its customers include OEMs and turbine tower manufacturers in OSW markets (figure 4). In each case, the unit of analysis is the buyer-supplier relationship and not the individual companies. The last focal firm supplier is a major UK-based reinforcement steel supplier (BRCO); its customers manufacture concrete gravity solutions for the UK OSW market (figure 5). Therefore, paired retrospective data from multiple managers of both the supplier and buyer sides of the relationship are collected to capture the relationship evolution over time (Pettigrew, 1990; Pentland, 1999).

	Case 1	Case 2	Case 3
Focal firm	MOCO	TACO	BRCO
Country	UK	UK	UK
Sector	OSW	OSW / Steel	OSW / Steel
No. of employees	1,000 (2017)	11,000 (2016)	1092 (2016)
Revenue	£500 million (2016)	£2 billion (2014)	£369 million (2013)
Perspective	Supplier/Buyer	Supplier	Supplier
Life-cycle stage	Early stages	Early stages	Early stages
No. of relationships studied	5	3	4
Political and market uncertainty	High	High	High

Table 4 Focal case companies

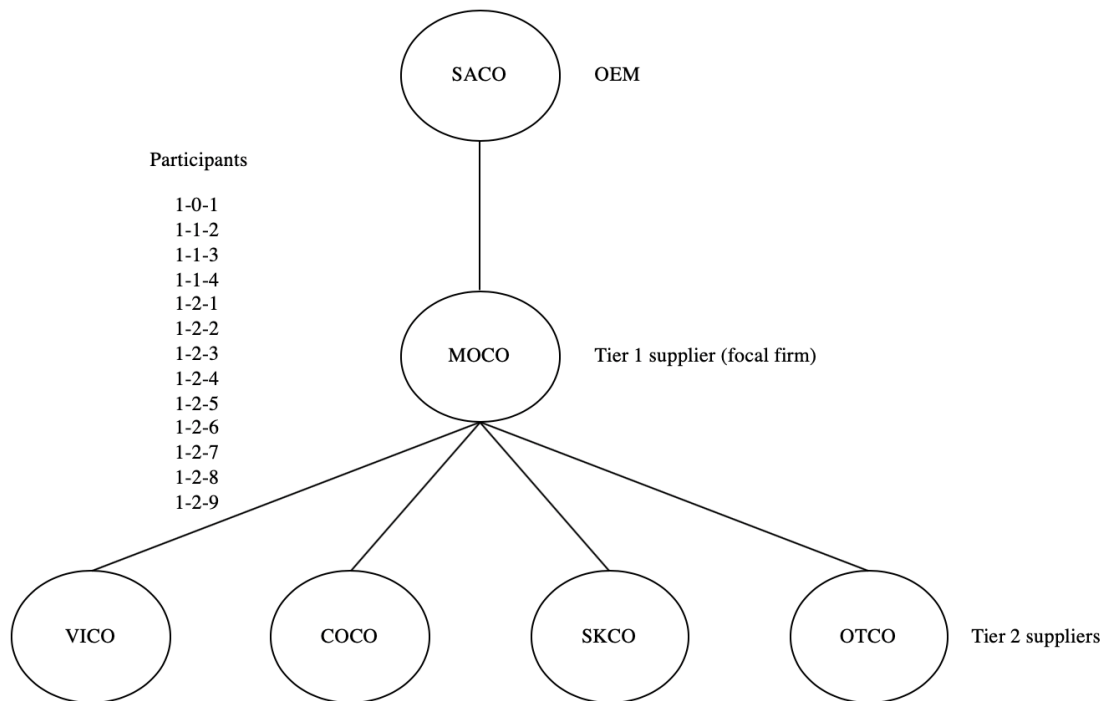


Figure 3 Case 1 setting

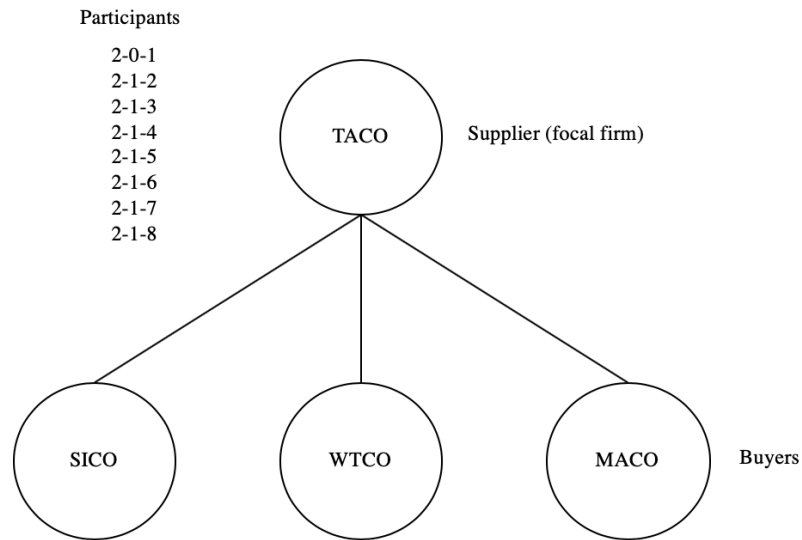


Figure 4 Case 2 setting

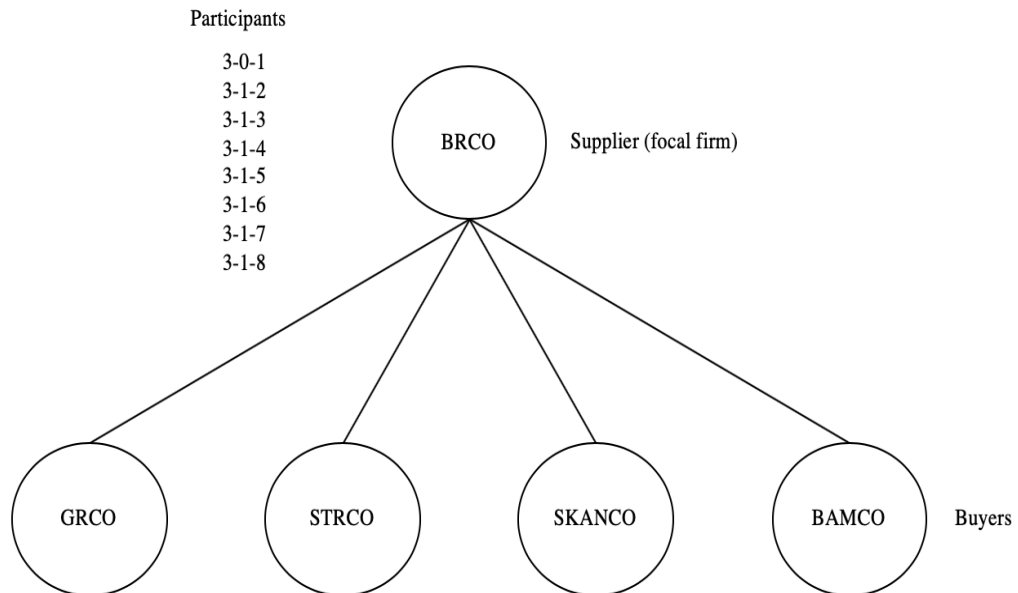


Figure 5 Case 3 setting

3.5.3 Interview Guide Development

This study uses a multiple case study approach where the process of data collection involved semi-structured interviews which were conducted in three participating companies located in the UK in the OSW sector. When collecting data via interviews, a lot of preparation and time was required to develop an interview guide that guided the researcher through the interview process in an effective manner. The following sections describe the development of the interview guide and its testing, through means of a pilot study to produce the final interview guide used for data collection in this study.

3.5.4 Quality of Semi-Structured Interview Data

Whilst the methodology chapter of this study has described the quality of research, this chapter studies issues associated with the quality of the data collected. When conducting semi-structured interviews, it is important that credibility¹ and dependability² are reinforced by the researcher, confirming that the participant and the researcher both have a shared understanding of the terms and definitions used. Credibility can be warranted by the researcher checking for face validity on the spot, to determine any differences in meaning between the researcher and the participant.

Apart from conducting the interview by probing and asking specific question set out in the interview guide, it is also important for the researcher to strengthen the dependability of the research by recording any environmental circumstances or background information on the participant to place responses or potential bias in context of the research.

It is hard to reach full generalisability across an entire population when adopting the semi-structured interview technique; however, Saunders et al. (2012) state that case studies undertaken with considerable rigour can often be used in more different contexts than studies that lack rigour in the research process. The rigour of the research is emphasised by identifying the logical connection between the methodological underpinning and semi-structured interviews, as most appropriate to answer the research question.

3.6 The Pilot Study

In order to authenticate and develop the arguments raised in the literature review chapter and the overall objective of the research question, it is necessary to undertake a preliminary pilot study. The pilot study helps the researcher to gather feedback from the participants, and provides insights as to how the interview guide should be developed. By undertaking a pilot study, it is possible to eliminate errors and potential misunderstandings and enables the researcher to test the questions in the interview guide for logic, relevance and suitability (Robson, 2002). Saunders et al. (2012) argue that the

¹ The credibility criteria involve establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research. Since from this perspective, the purpose of qualitative research is to describe or understand the phenomena of interest from the participant's eyes, the participants are the only ones who can legitimately judge the credibility of the results (Saunders et al. 2012).

² To address the dependability issue more directly, the processes within the study should be reported in detail, thereby enabling a future researcher to repeat the work, if not necessarily to gain the same results. Thus, the research design may be viewed as a "prototype model". Such in-depth coverage also allows the reader to assess the extent to which proper research practices have been followed (Yin, 2013).

conclusion of the pilot study analysis can provide initial findings that can enable the further development of these questions or the introduction of new questions.

As this study is adopting a qualitative approach, it aims to identify common themes and establish whether the topic area chosen is worthy of a research investigation to contribute further to the specific research topic studied. When choosing the participants for the pilot study, it is important to conduct the pilot with at least two different participants that are representative of the group of participants who will be used for the main part of the study (Gillham, 2000). The participants interviewed should hold similar positions and have similar backgrounds and experience to the main research interview participants. Thus, for the pilot study used in this research, several known participants were chosen due to their experience working in OSW. In-depth interviewing offered the most potential of the different methods of data collection for developing relationships and developing the researcher's skills for subsequent research.

3.6.1 Pilot Study Cases

Three face-to-face interviews were undertaken with suppliers in the OSW sector. The pilot study participants have a background in the respective industries at different hierarchical levels. The three OSW supplier/buyer interviews were undertaken at the workplaces of participants, all located in the North of the UK. One interview took place with the supply chain manager of a large multi-national steel producer that served a number of industries but had decided to enter the OSW industry. A product manager from a large UK reinforcement steel supplier was interviewed; the company had developed a new product with which to enter the OSW sector. Another interview was conducted with the key account manager from a multinational supplier of OSW gearboxes.

3.6.2 Data collection and Analysis of the pilot interviews

The analysis of the pilot interviews will consider each case individually and begin to detail the settings of each case and then to look for patterns and themes that relate to the research question. Once each case is analysed, it is then possible to analyse the cases together in order to identify common patterns and themes. Significant attention is required to signals in the interview process that will help to develop the interview guide. The analysis of each case aims to provide the researcher with an idea of response patterns on questions and whether the participants provide enough suitable data or struggle to on specific questions. The sample size used in this study is small and so the use of Cresswell's (1987) scheme is not pursued intensively by means of data analysis. It is

limited to presenting the case context, describing and analysing the case, and more emphasis is put on the interview process itself.

3.6.3 The UK OSW Sector Pilot Cases

The first pilot interview was conducted with the 55-year-old product manager of a UK reinforcement steel supplier that is headquartered and has several factories across the UK. He had been in the company for over 10 years working in several roles and was now responsible for selling a new product specifically targeting the OSW sector, a sector that they had previous experience in. The interview took place in the manager's office that he shared with the supply chain manager. The manager gave a tour around the steel production plant explaining the numerous processes involved in their new product. The preliminary interview lasted over an hour and involved the researcher asking mostly open-ended exploratory questions about the relationships the firm had with numerous customers.

To assist in answering questions regarding the impact of organisational change, numerous propositions and hypotheses can be generated from the case study. Through the development of hypotheses or propositions, a basis for further enquiry can be formed that can assist in helping to develop concepts and build grounded theory (Glaser and Strauss, 1967; Fielding and Fielding, 1986: 15). Grounded theory is defined as the discovery of theory from data that is systematically obtained and analysed (Glaser and Strauss, 1967).

3.6.4 UK OSW Case Context

Even though OSW energy is a renewable and secure source of energy (Pregger et al. 2011; Svanberg and Halldórsson, 2013) the OSW sector is still a relatively immature industry (Higgins and Foley, 2014) requiring significant cost reduction. It is believed that collaboration across OSW supply chains could yield significant cost savings (gov.uk, 2012) but there is a lack of study on how the OSW sector achieves supply chain innovation through formation of new inter-firm relationship (Arlbjørn and Paulraj, 2013; Svanberg and Halldórsson, 2013; Jensen et al. 2013).

The OSW sector with typically high market risk and political uncertainty characterises a unique challenge facing the initiation of any inter-firm partnership (Hamel et al. 1989). The OSW Developers Forum (OWDF) published a vision in early 2012 for "... The UK to be the centre of OSW technology and deployment, with a competitive supply chain in the UK, providing over 50 per cent of the content of OSW farm projects" (Crown Estate,

2012). More recently, the industrial strategy aims to deliver levels of UK content in UK OSW farms which are similar to those achieved by the North Sea oil and gas industry, where more than 70% of capital expenditure is through UK-based suppliers.

The OSW industrial strategy highlights that a threat to the UK OSW supply chain is the presence of well-established competition in other countries, as well as the threat of high competition for the location of top tier supply chain companies. European ports have already been gearing up to serve the OSW market and have begun to host clusters of supply chain companies, despite their domestic markets being much smaller compared to the UK market.

The supply chain has indicated that developers and top tier manufacturers could give more effective signals about project scope and timescales, and that reliable demand signals are needed on an on-going basis. Without this, it is difficult for the supply chain to invest in new facilities or equipment as the capital cost of new plants is high. It is vital that there is greater visibility of the size and timing of market demand to allow the UK supply chain to plan and be ready to deliver and give confidence to overseas manufacturers to establish facilities in the UK.

The UK's Climate Change Act 2008 (2008 Act) is a landmark piece of legislation – the world's first. That Act created a legally binding target for the UK to reduce greenhouse gas emissions by at least 34% by 2020, and at least 80% by 2050, taking 1990 as the base year. The UK has committed to legally binding EU targets to produce 15% of energy from renewable sources by 2020, which is equivalent to an eight-fold increase in renewable energy consumption from current levels. To achieve this, around 35GW of new renewable energy capacity is required by 2020 and OSW will be a primary driver for this.

The UK is world leader in the exploitation of OSW; in June 2013, the UK had an installed wind capacity of over 3.3GW and a further 1.3GW under construction (RUK, 2013). During 2012, the UK installed 73 per cent of Europe's additional offshore capacity (EWEA, 2013). The UK Government's £100bn round three programme will require the construction of 7,000 wind turbines, an unparalleled opportunity to develop an industrial supply chain, with the aim of supporting economic growth and long-term employment.

Under a strong growth scenario, the sector could deliver in the order of £7bn each year Gross Value Added (GVA) to the UK economy (excluding exports) and over 30,000 full time equivalent UK jobs by 2020, as well as £7–18bn in estimated net exports by 2030

(OSW Industrial strategy, 2013). However, there is much pressure on the UK government and industry to reduce the cost of energy. Consequently, the UK government has set the industry a target of reducing OSW costs to £100 per MWh by 2020 that assumes a 29 per cent decrease on the £140 per MWh cost of projects at the final investment decision stage in December 2011.

Another significant challenge is that currently British workers produce only a third of the components in the supply chain, with many of the jobs generated by the new developments being overseas in Denmark and Germany, where the turbines are made. To realise the economic benefits of the OSW sector in terms of jobs and growth and to maintain political commitment, there is no doubt that UK content levels need to be increased.

The Institute for Public Policy Research (IPPR) (2013) states that the OSW sector presents three key opportunities for the UK. Firstly, that the manufacturing potential is significant and will create jobs in both construction and operational phases. Secondly, this process contributes to the regional rebalancing of the UK economy. Third, Britain has a natural advantage in developing this technology due to its shallow waters.

The key informants are key account managers from the supplier firms personally involved in the relationship under study. Altogether, six informants were involved in unstructured interviews, (three for MOCO, two for TACO and one for BRCO).

3.7 Data Collection Approach

As the unit of analysis is the inter-organisational relationship between the buyer and the supplier, multiple managers on both the buyer and supplier side were required to take part in separate interviews. Participation involved taking part in unstructured and semi-structured interviews where participants who had been in a company for a relatively long time were encouraged to talk about novel concepts. Information on relationship trajectories were collected in a retrospective and inductive way, enabling a focused data gathering process (Leonard-Barton, 1990). To avoid participant bias that can lead to confusion about cause and effect relationships (Leonard-Barton, 1995), the data was triangulated by using multiple data collection techniques, such as, multiple interviews and review of documents (Jick, 1979). According to Pettigrew (1990) and Pentland (1999), it was important to make an explicit distinction between the two different data collection steps in this research, starting with the evolution of surface levels to deeper levels of data collection and analysis.

Firstly, an unstructured interview with the key informant was conducted as well as the review of relevant documents (e.g. contracts, reports, presentations and publicly available data). This would provide a graphical representation of the chronology of events that took part within each buyer–supplier relationship. Based on the definitions of Dwyer et al. (1987) and Ring and Van De Ven (1994) of relationship stages and the chronology of the events, it was possible to determine the beginning and end points of each stage of the relationship. This was validated by presenting the relationship life-cycle to the managers interviewed.

Secondly, semi-structured interviews were conducted with multiple managers involved in the relationship. The interviews were conducted face-to-face and were structured per the chronology of major events, where the available documents were re-examined to check whether the information given in the interviews were supported by the documents. A second round of interviews with the initial company contact took place in order to produce a more in-depth description of the evolution of the relationship. The researcher asked the manager to introduce me to any other colleagues that were involved in the relationship with the supplier. Finally, the researcher asked the buyer to introduce me to the supplier's managing director or sales manager. This way, the researcher was able to interview several people involved with setting up and developing supplier development initiatives between the buyer and supplier, on both sides of the relationship.

As suggested by several authors in the logistics and supply chain field, triangulation is applied throughout the study, combining both qualitative and quantitative research designs (Jick, 1979; Mentzer and Flint, 1997). Triangulation improves validity and rigour, and leads to a better understanding of the phenomena that are studied. Therefore, the research design of this study involves multiple case studies and documentary evidence alongside the collection and analysis of quantitative data. Thus, the survey instrument is constructed through case study protocols; they are then used again to interpret the findings of the quantitative analysis.

Competent and proficient data collection for a multiple-case study involves careful organisation and planning due to the extensive time and resource commitments required. For most case research studies that are exploratory, the triangulation of data (i.e. multiple data collection methods) is required; depending on the research question and unit of analysis, specific data collection methods will be adopted. Triangulation of informants was also employed where different informants were asked the same questions. Multiple

data collection methods can include documents, observations, interviews, and archives, and can be qualitative or quantitative, or both. Furthermore, using multiple methods enables the merging of multiple sources of evidence that enriches the research findings (Eisenhardt, 1989) and provides a more accurate picture of events (McCutcheon and Meredith, 1993).

In order to gain access and collect data from participants, this study started by analysing documents and archival reports; they were then followed up by interviews that provided a more detailed data from each case. The reliability of information could be verified through a combination of methods. Further, a major strength of case study data collection is an opportunity to use many different sources of evidence (Romano, 1989). Yin notes: “The most important advantage is that any finding or conclusion in a case study is likely to be much more convincing and accurate if it is based on several different sources of information, following a corroboratory mode” (1989: 97).

The use of documents in data collection enables: (1) verifying the correct spellings and titles or names of organisations that may have been mentioned in an interview, (2) verifying other specific details that can be supported with other sources; and (3) making inferences that might lead to further investigation (Yin, 2013: 87). Documents can take the form of newspapers, letters, agendas, minutes of meetings, articles, and company reports. For this research, the collection of various documents was undertaken before starting the interview process. These documents included company reports, press releases, company presentations, and news reports.

Collecting longitudinal data on inter-organisational relationships can pose serious problems (Anderson, 1995). To do so, researchers are required to collect data over several periods about the same set of relationships with identical partners. This task is almost impossible to carry out which can explain why longitudinal research is still an exception when analysing dynamic interfirm relationships. Previous research has overcome this challenge by collecting data regarding business relationships at one point in time, then classify the relationships by their stage of development and use this data for quasi-longitudinal analysis (Anderson, 1995). In this case, participants could classify their relationship stage themselves; however, the participants would need to be familiar with the concept of the relationship life-cycle (Jap and Ganesan, 2000: 234).

It is widely acknowledged by scholars and managers that relationships between firms evolve over time and are dynamic in nature. Dwyer et al. (1987) argue that relationships

will function differently as they evolve over time (e.g. expand, mature, decline); as a result, change is typical (Jap and Anderson, 2007; Jap and Ganesan, 2000). Relationship life-cycle perspectives explicitly distinguish that relationship establishment is a “development process” and that relationships follow a path dependent trajectory (Ring and Van de Ven, 1994: 112), although in a distinct clear-cut sense. Relationship “stages” are used by researchers as epistemological devices to describe differences over time in a continuous process; nevertheless, it is difficult to argue that a relationship changes straightaway at a fixed boundary when it transfers from one stage to the next.

In contrast, relationship–age perspectives use age as a continuous proxy for progress through developmental stages (Hibbard et al. 2001; Jap and Anderson, 2007; Lusch and Brown, 1996). The relationship–age approach differs from the relationship life-cycle perspective as it assumes that all relationships move through the development cycle at the same rate (i.e. ignoring temporal heterogeneity). Thus, using age as an indicator for relationship development implies that all ten-year old relationships are at the same development stage, ignoring any differences in growth rates (Eggert, Ulaga, and Schulz, 2006).

Further, relationships can experience a revival or second growth where for example, a new product is introduced (Ellram, 1991). A life-cycle view recognises that relationships move through stages at different rates where relationships trajectories are divided into discrete segments, and that all relationships within one stage embody the same developmental state until they move into the next homogenous state. Research on relational dynamics also addresses a key gap noted by Lewicki et al. (2006: 991), specifically, that little attention is paid towards “conceptualising and measuring relationship development over time”; instead, most research “has taken a static ‘snapshot’ view” of relationships.

3.8 Data Analysis Approach

The study focuses on buyers and suppliers operating in the UK. Following Ellram’s (2002) framework for multiple case studies, in total three focal companies involving 12 pairs of relationships were chosen for the study. Data was collected by undertaking semi-structured interviews with supply chain directors, supply chain managers, business development managers, and product managers. The objective was to cover all hierarchical levels in the focal organisations, to disseminate their different views on the role of compatibility and complementarity in relationship development. The researcher

constructed the interview guide using open-ended questions, specifically to derive long answers from the participants. Each interview conducted followed a certain structure that allowed comparison between the interviews and cases.

3.8.1 Data Analysis Strategy

From the review of OSW industry literature, an initial framework was developed to guide the analysis of strategic models and buyer–supplier conceptual development. Figure 6 illustrates that a conceptual framework was developed from the resulting theoretical constructions and previous research, together with exploratory interviews undertaken with OSW industry researchers and academics. The emerging conceptual structure covers the main features (aspects, dimensions, factors, and variables) and which relationships are of importance to the data collection process. The conceptual structure enabled the researcher to frame research questions to determine the approach to data collection.

Subsequently, conceptual categories were coded to aid the mix of data collection techniques used. The conceptual categories were decided in advance; thus, the process involved sifting through the data collected and assigning them into specific categories.

The representation of data was mapped out in diagrammatical form, employing a systematic approach (Lowe, 1992) to the analysis of qualitative data, known as the “qualitative coding matrix” (QCM). The research process involved the development of reflective questions in order to apply the critical realism approach, known as the critical realist research spiral, made up of four research tasks, namely: Designing, Investigating, Analysing and Explaining (Ryan et al. 2012).

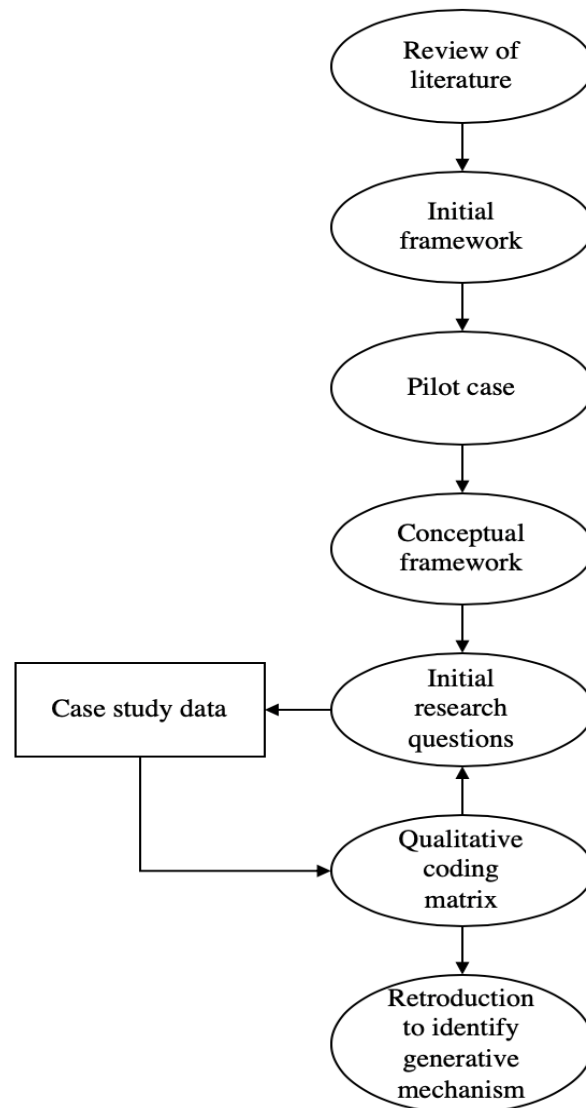


Figure 6 Case study data analysis strategy

The process of analysis, synthesis, and interpretation of qualitative data was repeated for each case to find causal links or relationships. Explanations of categories were undertaken and then compared with the previous analyses until all primary research had been completed. Subsequently, by comparing the different cases, relevant categories and their associated properties emerged.

3.8.2 Data Analysis Method

Thematic analysis is a theoretically flexible approach: this is because the search for, and examination of, patterning across language does not require adherence to any particular theory of language, or explanatory meaning framework for human beings, experiences, or practices (Clarke and Braun, 2013). Thus, “through its theoretical freedom, thematic

analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data” (Braun and Clarke, 2006: 78).

Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data. It involves the search for and identification of common threads that extend throughout an entire interview or set of interviews (Morse and Field, 1995). A theme therefore captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set. Themes or patterns within data are identified in one of two primary ways: in an inductive or “bottom up” way (Frith and Gleeson, 2004), or in a theoretical or deductive or “top down” way (Boyatzis, 1998).

In an inductive thematic analysis approach, coding and analysing themes to determine outcomes is achieved without using a predetermined framework. In this sense, the data drive the interpretation rather than trying to match the data to the researcher’s analytic interest (Kirk, 2011). In contrast, a “theoretical” thematic analysis would tend to be driven by the researcher’s theoretical or analytic interest in the area, and is thus more explicitly analyst driven (Braun and Clarke, 2006).

In this thesis, the categories were fixed as a result of the literature review. Rather than emergent phenomena, the main value of the data analysis was to evidence the categories established a priori. Therefore, thematic analysis was used more as a confirmatory rather than exploratory tool; the initial coding scheme can be found in Appendix 2. Consequently, a theoretical analysis was deemed more appropriate. This research followed the generic six-phase approach of Clarke and Braun (2013) for the conduct of thematic analyses and these include: (1) Familiarisation with the data; (2) Coding; (3) Searching for themes; (4) Reviewing themes; (5) Defining and naming themes; (6) Writing up.

3.8.3 Familiarisation

Familiarisation of the data was an ongoing process. All interviews were recorded and points of substantive interest were noted down during the interviews. The interviews were transcribed immediately after they had been conducted; this ensured that the content of the responses was absorbed when the information was still fresh. Once all the interviews and transcription had taken place, all the materials were re-read; nevertheless, it is worth noting that the analysis was conducted as a gradual and incremental process as data was

collected. This approach ensured that the data was “intimately familiar” (Clarke and Braun, 2013).

3.8.4 Coding and Theming

In order to establish systematic rigour to coding process, the data analysis process adopted the QCM. The QCM is shown in figure 7 and provides the discrimination between data sources and various interpretations which could be made by the different parties (e.g. the researcher, perceived wisdom of the academic community, and the participants themselves) (Graham, 1998). The data sources used in this studied and mentioned above, are open to a range of different interpretations. Lowe (1991: 8) identifies three:

1. Pre-understanding
2. The participant’s view as the research unfolds
3. A priori constructs.

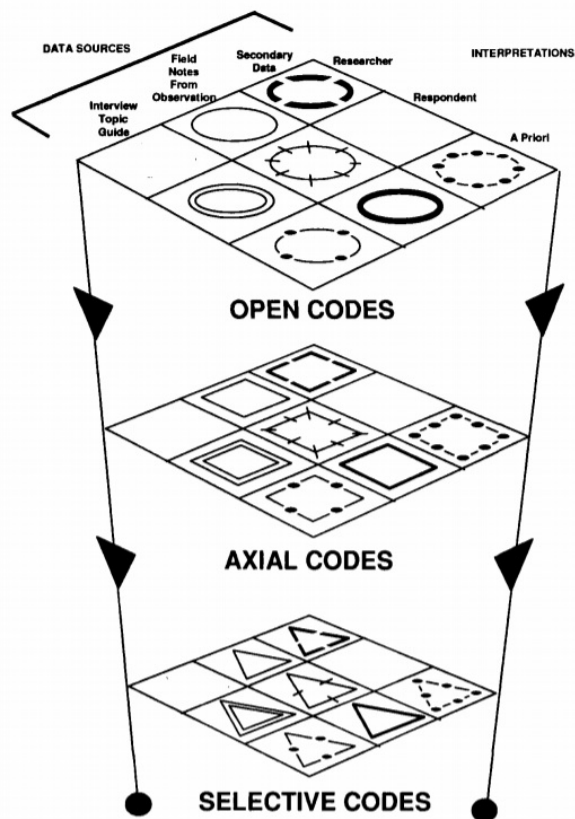


Figure 7 The Qualitative Coding Matrix (QCM)
(adapted from Lowe (1991: 9))

For each stage of the research process, the data sources and interpretations are coded with a unique symbol and alphanumeric code (refer to figure 8), which allows the reader to penetrate the researcher’s intuition and judgement as they move from analysis to synthesis

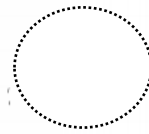
and finally interpretation (Graham, 1998). The process of discrimination between data sources and interpretation occurs at three levels of the research process:

1. Analysis “open” coding
2. Analysis/ synthesis “axial” coding
3. Synthesis/ interpretation “selective” coding.

(Lowe, 1991: 9)

Coding was hand-guided by the research question and the theoretical framework established a priori. Drawing on the resources provided by grounded theory (Glaser and Strauss, 1967), data was coded in three separate phases. Firstly, to generate initial, low-inference codes (i.e. open codes), key words from the participants’ transcripts were identified that chimed with the established categories. The three types of open codes are shown in Figure 8 below.

Issues raised from the topic guide using the researcher’s own interpretation:



Issues raised from the literature as interpreted by the researcher:



Issues raised from field notes used following periods of direct observation:

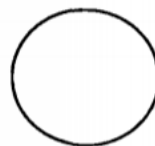


Figure 8 Explanation of open codes
(adapted from Lowe (1991))

These categories were extracted from the literature and codes were organised to illuminate, on the one hand, the central features applicable during the different stages in the life-cycle of relationship formation (see appendix 2), from awareness to dissolution.

On the other hand, codes were assigned to factors that accentuate the basis of successful relationships (see appendix 3).

Figure 9 illustrates the effects of the “open” codes when they are overlapped on the text. The extract is taken from an interview with the supply chain manager at the first case study company. The number inside the circle represents the sequential chronological order that the issue was raised in the interview.

Participant identifier	Transcript	
Participant 1-0-1	It was hard to know what to expect next from the buyer in our negotiations	14
Interviewer	How did this effect your ability to increase compatibility between your organisations?	
Participant 1-0-1	We had to make many sacrifices to the way we normally worked.	15
Interviewer	Was this the case for other customers you worked with?	
Participant 1-0-1	Not all, many of our other customers were more geographically and culturally aligned.	16

Figure 9 Participant remarks – coding illustration

The beginnings of the next stage ‘axial’ coding starts to emerge. Data is categorised on the basis of the conceptual framework and research questions. Secondly, based on the same taxonomy, a high-inference coding process (i.e. axial coding) was adopted in which similar codes were grouped into broader categories. Within each primary code, sub-categories were created by using codes from the original list and by breaking down complex codes into sub-categories (Ferguson and Islam, 2008). “Axial” codes were created by the researcher using their own verdict on the “open” codes that had similar characteristics.

Finally, memos were used to elaborate on the categories and establish theoretical connections among codes (Lofland and Lofland, 1995). Interesting quotes from the participants were retained as appropriate. These were kept in tabular format against the categories they referred to, indexed by the participants from whom the quotes were taken. All participants were assigned a key and kept separately from the main findings, only key coded terms were used to link quotes with participants.

The ‘open’ coding was then combined with the initial starting lists of codes and shown in diagrammatical form in Figure 10. Within each category and sub-categories there are arrows identifying the beginnings of logical relationships between the open codes. The abbreviations relate to the participants interviewed (e.g. SCM is the supply chain manager, D is the director, TPE is the technical product expert and KAM is the key account manager).

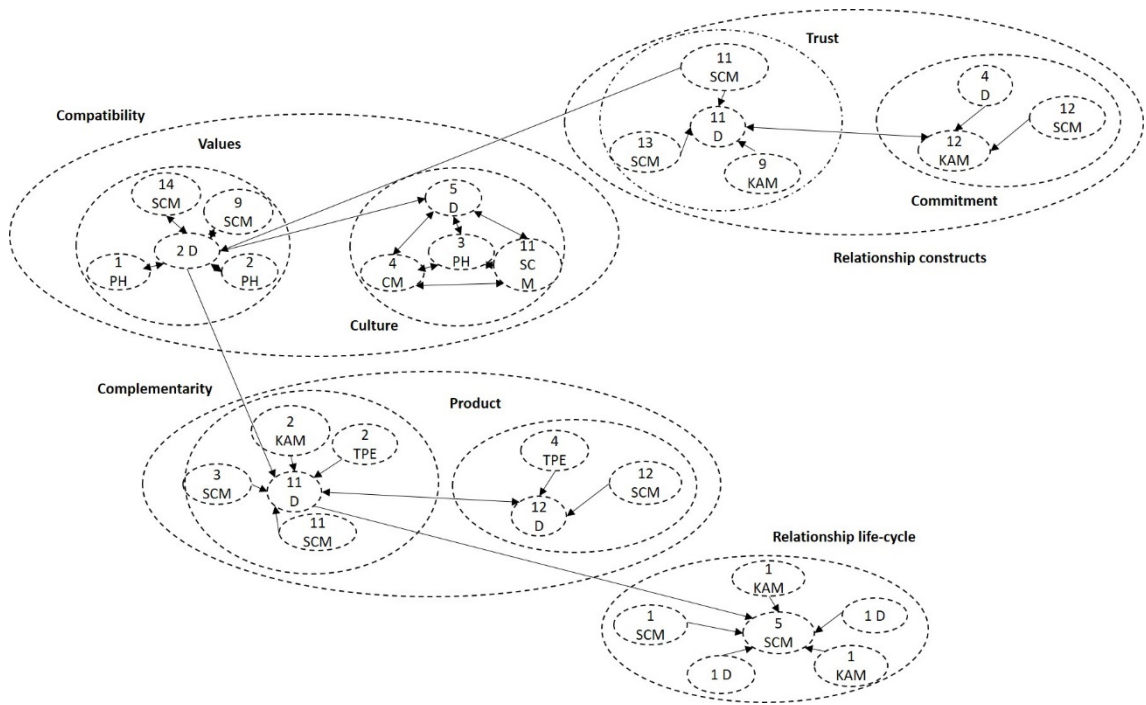


Figure 10 The footprint effect of open codes

‘Axial’ codes are created by the researcher using his own judgement on those ‘open’ codes which have a logical relationship with one another. A single ‘axial’ code is often created from several open codes which have logically similar characteristics. Towards the end of the ‘axial’ coding phase the logical relationships of one ‘axial’ code with another is drawn in the form of a diagram. The final stage of the coding process is ‘selective’ coding. These codes are upgraded ‘axial’ codes which have been drawn together from different sources where triangulation can be established. Interviews are then triangulated with evidence taken from field notes of direct observation, company reports and document analysis.

To assess what relationship stage partners were in, this research employed an instrument was based on Jap (2001) and Jap and Ganesan (2000). Managers involved in the interviews were presented with the statement, “Relationships typically evolve through a number of phases over time. Which of the following best describes your firm’s current

relationship with (named customer/supplier)?” Managers could then check which description best applied to their relationship. It was important that the instrument employed gave enough description of each stage for the participant to correctly identify and classify their existing relationship. Furthermore, the descriptions were developed so as not to reveal all the dynamics involved in each stage (see appendix 4).

The participants were asked to classify which stage of the relationship their organisation was currently in. But also, if the relationship had already existed at the time of the interview, the participant was asked if they had been involved in the formation of this relationship and if so, how many years ago. They were then asked to classify their relationship over the period of time they had been involved in the relationship. This introduced the threat of retrospective bias, but is minimised when participants were asked to report on concrete facts or events, when questions were simple and non-detailed, or when the phenomenon did not occur in the distant past (Miller et al. 1997). Participants were only included in this research if they had personally managed the relationship in question.

3.8.5 Retroduction

Retroduction started with describing the cases and the main issues within these relationships concerning events, activities, exchanges and attitudes towards their new business partners across a timeline. This required interviews to be undertaken on the business’s premises with supply chain managers, key account managers and other key actors involved in the supply chain relationship. The purpose of the interviews was to investigate and record the relational constructs involved in the buyer-supplier relationship and gain insights on the types of compatibility and complementarity that were prevalent.

On-site interviews and observations were used to capture a consistent description of the environment the company was operating in, (e.g. under high uncertainty), as well as the specific attitudes of staff towards the relationship in question. The participants activity related to supply chain and logistics was closely observed by the researcher for a period of three up to twenty-four months. After that, a systemic “binding” of the findings took place at the supply chain dyadic relationship level, this amalgamated the data obtained from interviews, other sources and in different forms for evaluation in order to develop a rich depiction of the context, situation and relationship.

Once the writing up of the case description was complete, involving drawing a timeline of major events taking place in the relationship that would typically cover the relational,

compatibility and complementarity constructs. A deconstructive process was undertaken in order to extract and analyse differences between the organisations as well as analytical resolution of the issue were preceded by a stage of reflection to explain the behaviour observed in accordance with existing theories.

The data was then analysed through extraction and analysis of the similarities and differences between the partaking companies. It was then possible to identify the causal mechanisms that explained the evolution of the relationships over time, using abduction and theoretical resolution. For the cases studied, when the relationships arrived or moved on from a particular relationship life-cycle stage a major event was recognised where the conditions, such as compatibility (e.g. values, culture, personal relationships) and complementarity (e.g. product, technology, market knowledge, technical expertise) were identified and related to social structures (e.g. trust, information sharing and governance), thus generative mechanisms were identified and theorised.

4. DATA ANALYSIS

The data analysis for this research study is structured in two main sections: the within-case analysis and the cross-case analysis.

4.1 Within-Case Analysis

The within case analysis studies 12 pairs of relationships in detail, analysing various relational constructs and the effect of compatibility and complementarity on relationship life-cycle stages.

4.1.1 Case #1

This case studies MOCO (focal company), major player in the offshore wind industry supplying gearboxes to its customer SACO, an offshore wind turbine OEM. It also studies MOCO's relationships with four of its gearbox component suppliers VICO, COCO, SKCO and OTCO.

The case is primarily informed by the following participants: 1-0-1 as MOCO's UK director; 1-1-2: MOCO's key account manager; 1-1-3: MOCO's supply chain director and key account manager; 1-1-4: MOCO's technical product manager. As well as industry experts including; 1-2-1: Director, UK OSW Industrial Strategy, UK Department for Business Innovation and Skills; 1-2-2: OSW UK Manufacturing Advisory Service consultant; 1-2-3: OSW consultant; 1-2-4: Director, Team Humber Marine Alliance; 1-2-5: Deputy Head of Renewable Energy at Department for International Trade; 1-2-6: Market Intelligence Manager, Renewable UK; 1-2-7: Information Manager, Renewable UK; 1-2-8: SICO business development manager and 1-2-9: Director of Concrete gravity foundation supplier. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

MOCO's case is studied from both the supplier and buyer perspective. MOCO is a designer and manufacturer of gearboxes to both onshore and offshore wind sectors, installing 14,000 units worldwide with significant capabilities in the service side of gearboxes, involving repairs, spare parts, field service. MOCO is headquartered in Finland where it has two manufacturing units, with two assembly facilities in the UK and US; service workshops in Australia, Germany, Finland, UK, and Canada; three locations in the US; and sales teams/offices in Spain and Italy. MOCO employs over 500 employees globally. SACO is a company based in South Korea, a turbine OEM that was new to the

OSW sector. They have strong design and technical experience in numerous industries and are a well-known brand in electronics with over 270,000 employees worldwide.

Interviews and access to MOCO were initiated with previous meetings and personal relationship development with the Director of UK Business Innovation and Skills offshore wind industrial strategy. The researcher met the director of UK Business Innovation and Skills (Participant 1-2-1) when attending a UK offshore wind conference in Manchester and then again at a global offshore wind conference in Glasgow. The UK Business Innovation and Skills director showed interest in the researcher's study and suggested MOCO as an excellent case of UK-based manufacturing attracting overseas customers. Through several email exchanges and telephone conversations a meeting with MOCO's director was scheduled. The researcher's first meeting with MOCO involved travelling to their facility in the North of England.

To answer the research question of this thesis, it was necessary to contact employees that had significant experience dealing with customers and suppliers; in this case, the first point of contact was the director, who would grant the researcher access to the staff involved in the relationships with MOCO's customers, in particular, the key account managers for MOCO's current customer SACO. The first interview was arranged with the director of MOCO, referred to as participant 1-0-1; on the same day, the researcher also interviewed the key account manager, (referred to as participant 1-1-2) for MOCO's current overseas customer, SACO. Participant 1-1-2 played a high-level role in the newly acquired organization and was solely responsible for the relationship between MOCO and their sole customer SACO. It was vital to establish a personal connection with the participant to provide an atmosphere where questions based on relationships with supply chain partners could be answered honestly and openly. A recorder was used and a transcription produced. The interview involved asking the respondent for their personal views on numerous constructs such as trust, information sharing, communication, and more, as well as their perspectives on the development of the relationship between the two companies from inception until present time.

Each preliminary interview lasted approximately one hour, in which the participant was asked to respond to various questions outlined in Appendix 5. Follow-up interviews were then conducted three and six months after the last, where the participants would provide answers to the same questions and feedback on any developments and major events that had taken place. These follow-up interviews would last between 30 minutes and one hour

in duration. The interviews were conducted from early 2013 until the end of 2014. It was clear during the interview that the participant had significant knowledge and experience with the ins and outs of relationships with major customers, in fact their sole customer. After the first participant interview, the second participant walked straight into the room and sat down. The second participant was the director of MOCO's supply chain. Before the interview started the participant was reminded that the interview would be recorded and would be confidential subject to a non-disclosure agreement. The interview provoked many emotive suggestions from the participant and their personal relationship with many of their suppliers.

In early 2009, a market analysis was undertaken by MOCO that identified that the rail and wind sectors were two markets that MOCO was not in and should be in. MOCO entered the wind market through learning about inspections and repairs and learning about the problems with competitors' gearboxes, although at the time MOCO were not manufacturing gearboxes for wind turbines. MOCO's experience was built on maintaining and servicing gearboxes that had been manufactured for onshore turbines. Later in 2009, MOCO acquired DACO's OSW gearbox facility in the North of England. DACO was a well-established British manufacturer for gearbox applications in military, oil and gas, and other sectors. MOCO made the investment to acquire DACO's OSW facility and engineering capabilities as a means of entering the UK OSW market. Not only was the facility close to the UK OSW market, but it also had a strong reputation for making reliable, high-quality gearbox applications. The acquisition gave MOCO the necessary resources and capabilities to design and manufacture new gearboxes suited to the OSW sector, whilst previously MOCO had only been involved in the service and maintenance of gearboxes. Through the acquisition MOCO intended to enter the market through product specialization, custom designing a gearbox application to suit the customer's needs unlike the other suppliers in the OSW market; participant 1-0-1: "Competitors were offering products that already existed." This led to the MOCO undertaking investment significant capital and resources to undertake train studies looking at different turbine layouts to offer an optimized solution to the customer.

From the acquisition MOCO had two aspects to their business: there was the repair and service side for onshore and offshore, wind turbine gearboxes, and then there was the new build side involving new product development of offshore wind turbine gearboxes. This research focuses on MOCO's new build side of the business. MOCO intended to enter the market through product specialization, through custom-designing a gearbox

application to suit the customer's needs unlike the other suppliers in the OSW market. This led to MOCO undertaking significant investments in research on train studies and looking at different turbine layouts to offer an optimized solution to the customer. When considering the market that MOCO operated in, it was sparse: it consisted of European monopolies that had existing ties with the OSW turbine OEMs. MOCO had many advantages compared to other gearbox manufactures, especially in the UK OSW sector: firstly, they were in the UK, and secondly, they had acquired significant capabilities and experience in gearbox solutions, and some advantages in the OSW sector. Participant 1-0-1: "In the UK, we are the only gearbox manufacturers with a facility of significant size in the UK in wind. We have one competitor, they are the only other gearbox manufacturers in the UK but they don't operate in the renewable energy market, they do high speed power generator gearboxes for gas turbines (ex-Rolls Royce company)."

MOCO operated a global key account management structure, which involved matching MOCO's senior personnel with their customers' senior personnel, and matching lower level personnel, for example, technical staff and designers with similar staff in their customers' organization. Participant 1-0-1: "We match our senior guys with their senior guys, and we match staff across both organizations." Participant 1-1-2 was responsible for key account management of MOCO's relationship with SACO as this relationship was based in the UK, whilst MOCO used different KAMs for each country in Europe it operated in. MOCO had a key account manager based in Germany who would be responsible for MOCO's relationships with their other customers, wind turbine OEMs. There was another key account manager based in Spain and one in Finland to work with the wind turbine OEMs in their respective markets.

Before moving into the relationships between MOCO and SACO, it would be beneficial to first understand the ways MOCO entered the offshore wind markets, competition, customer base, and political situations surrounding renewable energy in the UK. While a gearbox can be used in many different onshore wind turbines, MOCO realized that gearboxes for offshore wind turbines are often highly customized, and so required a close and cooperative relationship between the turbine OEM and gearbox manufacturer, to come up with a suitable and workable solution. The OSW market is characterized by monopolies of suppliers and customers; for MOCO to be a player in the OSW industry they would have to work extremely hard in convincing potential customers that they could provide a reliable gearbox application. Participant 1-1-3: "I think we will see a lot more single sourcing in the offshore wind industry. You will see supply chains competing

against supply chains, as there isn't enough business to take on multiple suppliers. They also tend to be different products, for instance, the gearboxes we make for onshore (3MW gearbox) may fit three or four different turbines, and a turbine manufactured by an OEM may take three or four different gearboxes..."

MOCO highlighted that a major issue for them entering the OSW sector was the need for volume orders from a customer; the cost of designing a prototype and then manufacturing it was so high that MOCO needed to manufacture 150 units before being able to break even on their investment. However, the UK OSW sector at its peak could only provide demand of 100 turbines per year; with that being split, MOCO could supply 50 per year and still would not be able to break even. This emphasized the changes in the OSW sector leading to single supply chains competing against each other and a trend towards alliancing. The lack of stable UK renewable energy policy made it difficult for MOCO to enter the OSW sector. Participant 1-1-2: "The political situation has changed this year (2014). Now people understand the market due to governmental reforms. There is now the offshore wind industrial strategy in place with the draft strategy in place which has helped us." Participant 1-2-1 is the director of this director of the UK OSW industrial strategy and provides insights on the development of the OSW sector throughout this case. Political factors specific to the UK had an impact on the way MOCO competed in the UK market compared to the other OSW sectors they were in across Europe. The UK had an "open market" policy where any company could compete for a contract as long as they met the bid criteria. Participant 1-1-3: "If you want to sell into the French market you have to manufacture in France; however, it is different in the UK."

The UK OSW sector faced high uncertainty; there was now a need to source from the UK. The UK government encouraged the use of local suppliers with the hope of increasing local content where OEMs would require their suppliers to provide a list of all their UK suppliers and what percentage of their turbine came from the UK. Participant 1-1-2: "UK content is becoming a hot potato now; our prospective customers are requiring us to provide a list of all components we source from the UK ... Consequently, we were selling the UK, showing them the UK should be their manufacturing location rather than another country." Another challenge for MOCO, a new entrant to the OSW industry, was that the OSW industry required very high tolerances for gearboxes and cleanliness standards for gearbox applications. This posed a challenge for MOCO as it was vital that they had the right supply chain in place to be able to offer components that could meet

the strict requirements for the UK OSW sector. Participant 1-1-3: “It is very difficult to find the right suppliers.”

In 2009, DACO made orders to several suppliers to supply components to be built into a gearbox for offshore wind turbines. However, due to market and political uncertainty, the decision was made to sell DACO to MOCO. Ownership changed from DACO to MOCO in September 2013. Immediately, the supply change collapsed; this was due to MOCO not having a supply chain professional in place, but also to the fact that all the staff involved with developing supplier relationships and all the people involved in the agreement of contracts with DACO’s gearbox component suppliers stayed at DACO. This meant that MOCO needed to start from scratch, developing supplier relationship with all the previous companies involved in the supply chain.

DACO had previously agreed contracts with the above-mentioned suppliers that MOCO had to renegotiate and revitalize relationships with. MOCO decided it would employ one manager, Participant 1-1-3, to be responsible for their entire supply chain for the capital side of the business, responsible for new build projects, and in particular, the offshore wind turbine gearbox. There was also another supply chain manager who was responsible for the service side of MOCO’s business. Participant 1-1-3 got involved in the project in March 2013, and in September DACO transferred the business. The programme had been running since 2008/9, and it was already established. When Participant 1-1-3 took over as the supply chain manager involved in the ongoing orders for gearboxes components, the organization was made up of the purchasing manager, purchasing department, the supply chain was already established. When it was acquired by MOCO, he had to pick up that responsibility, and together, in October 2013, with staff from Finland, undertook research on the UK offshore wind supply chain and could not find a supplier in the UK which could provide a product to the right standard, quality, and size. Size was a big issue, as the gearbox MOCO were manufacturing was the biggest in the offshore wind market, which meant there were limited facilities that could handle manufacturing operations of that size.

Participant 1-1-3 had the challenge of starting all previous supply chain relationships from scratch, and was new to the supply chain in offshore wind: “I have been researching the supply chain and found that it is very thin in the UK.” This was reflected in previous DACO sourcing decisions from countries such as the Czech Republic and Germany. In the UK, there were no companies that could provide MOCO with a product to the right

standard, quality, and size. Size was the big issue with their gearbox. At the time of this research MOCO's gearbox was the largest available in the offshore wind market globally. As a result, there were limited facilities available to MOCO to handle that scale of manufacturing.

The gearbox MOCO supplied to their customer was a gearbox made up of several major assemblies, three stages with a major stage in each, involving three main suppliers that were outlined in this case, namely: VICO – who would manufacture the raceways that housed the bearings in the gearbox; OTCO – who were in Germany and provided the annulus ring; SKCO – who would supply the bearings to MOCO; MOCO would then supply these bearings free of charge to VICO who would then provide MOCO with the completed assembly. Other suppliers providing other components and services that were studied in this case were ADCO, providing component machining services, and COCO, a foundry providing small component castings. In its entirety, MOCO's gearbox was a very complex product: even the bearings were complex, compared to bearings used in other applications and industries. The gearbox was made up of bearings, an inner race, outer race, and rollers; specifically, in MOCO's case, designing an offshore wind gearbox meant that the planet gears formed the outer race, an inner race set of rollers fitted inside the bore of the gear, which acted as the outer race. So, the form of the bore of the gear had to be perfect to roller bearing standards, which required very high technical specifications and quality standards.

Due to the high quality and technical standards present in the offshore wind market, there were very few competitors in the market available to offer MOCO gearbox components, which had a major impact on MOCO's ability to compete in the market. When asking Participant 1-1-2 about what impacted the ability of MOCO to compete in the offshore wind market, he explained that, in a normal purchasing environment, the factors impacting the competitiveness of MOCO was the ability to deliver on time, at a reasonable price, and at an acceptable quality. However, because the supply chain was so limited and small, MOCO were in a captive market where there was no opportunity for them to compete; Participant 1-1-2: "We are forced to accept the prices and deliveries they offer."

To begin reconnecting with suppliers, Participant 1-1-2, along with Participant 1-1-3 and Participant 1-1-4, undertook a tour of their European suppliers in the Czech Republic and Germany, visited company facilities, shook hands with them, and re-established contact

with them, explaining why they had not been in contact with them, and why they had not been ordering parts from them recently. This then led MOCO discuss new contractual agreements with each of the suppliers, as the contracts made previously were done so by the top echelons of DACO; thus, Participant 1-1-2 and 1-1-3 were not made aware of these agreements and so each agreement with the suppliers had to be explained, understood, and then negotiated. What was interesting about this case was that it showed how each of the suppliers approached the renegotiation of contracts very differently, and illustrated numerous challenges MOCO faced when forming new relationships with each supplier.

4.1.1.1 Case #1.1

This case examines the relationship between supplier MOCO (focal company) and buyer SACO. The case is primarily informed by the following participants: 1-0-1 as MOCO's UK director; 1-1-2: MOCO's key account manager; 1-1-3: MOCO's supply chain director and key account manager; 1-1-4: MOCO's technical product manager. As well as industry experts including; 1-2-1: Director, UK OSW Industrial Strategy, UK Department for Business Innovation and Skills; 1-2-2: OSW UK Manufacturing Advisory Service consultant; 1-2-3: OSW consultant. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

To enter the OSW sector MOCO decided to enter a licence agreement with a manufacturer for a flex pin that enabled MOCO to keep their gearbox relatively small compared to the strain put on it from OSW turbines. MOCO's gearbox is a very complex product that requires gearbox designs to be extremely accurate, due to the amount of torque running through them; for example, the gearbox manufactured in this case for SACO had the torque equivalent of 16,000 Jaguar car engines. Furthermore, MOCO had to improve their quality procedures when manufacturing and assembling the components that made up their gearbox. An investment was made in a washing machine for their facility where they could wash the gearbox parts at 80 degrees with special detergents. 1-1-2: "We were surprised at the quality requirements; they were a lot more stringent than gearboxes used for other sectors (cement and coal mine gearboxes)." The consensus from interviews involving MOCO personnel illustrated the OSW sector as a market with monopolies and strategic partnerships with supply chains competing against each other. In addition, the customer base for MOCO had been changing rapidly. Participant 1-1-2: "There has been a lot of rationalisation of our customers; OEMs such as Vestas and

Mitsubishi have joined forces, so have Areva and Gamesa, and others like Clipper have stopped operating.” In contrast, the gearbox manufacturers market had not changed much, and MOCO had three main competitors, namely, Hanson, - who provided industrial gearboxes, as well as Bosch, and Winergy (owned by SICO, an OEM).

The offshore wind industry was volatile and uncertain, Participant 1-1-3: “We have seen that the wind industry has been through boom and bust and is now starting to come back again ... There was a time when people couldn’t offer a product quick enough. Now, because the build out rate is pretty low, SICO and Vestas are able to supply the market with their existing Danish factories, so that gives no reason for investment in the UK to occur.” MOCO faced other challenges in the UK market; for instance, OEMs such as Areva and SICO had existing well-developed supply chain partnerships already in place. The OEMs had beaten MOCO’s customer SACO to purchasing a large port location on the Humber estuary to set up their manufacturing facilities. If SACO had been successful, there would have been a much greater chance for MOCO to secure an order. Despite many of the challenges MOCO faced in the UK market, they had several advantages over their competitors. Participant 1-1-2: “In the UK, we are the only gearbox manufacturers with a facility of significant size in the UK in wind. The only other gearbox manufacturers in the UK who have significant facilities don’t operate in the renewable energy market.”

Awareness stage

MOCO first met SACO in August 2010 when Participant 1-1-2 was first employed by MOCO. There were no previous ties between MOCO and SACO. SACO had choice of many gearbox suppliers in the market. SACO was looking to find a feasible UK supplier for projects they would be bidding for. MOCO knew SACO were entering the UK market and had made enquiries to several potential suppliers in Europe to build a new, innovative gearbox for their larger turbine prototype. MOCO didn’t have a product or a track record, but had acquired the experience and capabilities in 2009 giving them a long track record in military, oil and gas, and other high torque low speed applications going back over 100 years.

MOCO met several challenges during the awareness stage. OEMs tended to use proven suppliers and technologies and showed unwillingness to explore and engage with new suppliers. When asked about the offshore wind industry norms and standards, Participant 1-1-2 stated: “The wind industry is a very strange industry: turbine specific application lists are sought after.” To mitigate this factor, MOCO employed an independent specialist

to undertake verification work on their calculations that what they were doing was correct; Participant 1-1-2: “That was one hurdle.” MOCO made significant efforts to be very collaborative in their approach towards SACO, conducting a lot of work and analyses free of charge. Building up new relationships with OSW OEMs was time-consuming and costly. One of the main issues faced by MOCO in the awareness stage was gaining SACO’s trust in their ability to manufacture a gearbox for the OSW sector. Participant 1-1-2: “Challenges we faced were lack of track record: we were competing against people who had thousands of turbine gearboxes already installed and had manufacturing experience. While our acquisition gave us lots of experience in gearboxes for different applications (military, oil and gas, and more), we didn’t have wind turbine specific experience.”

MOCO’s competitors had already built an 8MW gearbox that they were making for a major turbine OEM and so they could easily provide a potential MOCO customer such as SACO with a working, tested product. MOCO’s argument was that customers such as SACO would need to build their own turbine design around an existing gearbox offered by MOCO’s competitors, whilst MOCO could build a gearbox around SACO’s turbine. MOCO offered SACO complementary resources in terms of technical product knowledge, industry expertise, and distance to market. Yet SACO had limited complimentary resources for MOCO to build competences with. There were significant incompatibilities between the two organizational cultures from the start.

Another challenge MOCO faced on the new build side of their business was that they only had one customer and one product. So, if their potential customer (i.e. SACO) failed, they would in turn fail as well. Participant 1-1-2: “They [SACO] do have the potential to source a gearbox elsewhere, but only on our engineering merit and delivery performance, we maintained that position. That is not an issue now, the issue now is with the design of the nacelle and the turbine itself.”

Wind turbine OEMs such as Mitsubishi, Vestas, Gamesa, Areva, and Samsung manufactured turbines that require a gearbox, unlike SICO and Alstrom who produced direct drive turbines with no need for gearboxes like MOCO’s. However, the largest turbines in the sector generating 8MW produced by Vestas and Areva did require gearboxes. When talking to SACO’s management board, Participant 1-0-1 explained: “How will you differentiate yourselves against your competitors if you all have the same drive train? So, coming up with something innovative, lighter and smaller is going to give

you an edge in the market.” MOCO offered SACO numerous unique complementarities, but thanks to efforts made on the softer side of the business, MOCO’s staff making significant sacrifices to increase compatibility between the organizations helping to secure SACO’s trust in MOCO as a viable long-term partner.

MOCO believed they had something unique to offer SACO. MOCO had a lot of experience developing close relationships with UK ports and all the government entities involved in offshore wind as well as local government. MOCO had also built up strong links with the Scottish Government where numerous offshore wind testing sites were available and could be used by SACO to demonstrate their future turbine. This convinced SACO to start more in-depth discussions with MOCO and triggered the Exploration stage.

Exploration stage

The exploration stage involved the design and production of the two prototypes and the build -up for the commitment for the 150 units. This stage involved more intense communication where compatibility and complementarity between the two companies were being discovered, addressed and improved. The development of prototypes also required larger capital investments Participant 1-0-1: “In terms of serial production of a wind turbine gearbox, you are looking at £100,000 per MW. A prototype is around 50% more expensive.”

MOCO aimed to serve its customers on the premise that they could tailor-make a product to suit the customer’s needs, as competitors in the market were offering products that already existed. To demonstrate this commitment, MOCO would make further investments to show their capabilities to SACO; for example, MOCO undertook a train study especially for SACO to look at different turbine layouts and offer an optimized solution. SACO was impressed with MOCO’s technical capabilities and ability to custom build a gearbox to SACO’s requirements.

This was especially important as SACO was in the process of developing a new 8MW turbine which involved designing the whole turbine from scratch. Designing the gearbox from scratch and customising it to their supplier’s requirements was a crucial step to demonstrate unique complementarities. MOCO could provide a design that would be lighter, smaller and more innovative than what was currently available on the market. This argument strengthened MOCO’s position as it allowed SACO to differentiate their product against their competitors.

During the exploration stage MOCO assigned Participant 1-1-2 as global key account manager for SACO. His sole responsibility at MOCO was the new product development project with SACO. Having MOKAM1 assigned to SACO enabled high levels of communication between the companies, and showed MOCO's dedication to providing help to SACO whenever needed, which helped build SACO's trust. MOCO realized they needed to build more trust with SACO. One of the mitigating factors for MOCO was to employ a company to undertake verification work on some calculations to show that what MOCO were doing was correct and that they were capable of manufacturing to OSW standards. This was received well by SACO who saw MOCO's investment as a strong sign of their commitment to proving their capabilities and that they were a feasible supplier for SACO.

The next hurdle for MOCO was the investment required in research and development. MOCO's first offer on the table included the price to develop the prototype then the price of each unit after the prototype. According to Participant 1-0-1, SACO staff commented: "We don't want to pay that because we are talking to suppliers that don't have all research and development cost to incur." MOCO then decided it would undertake the research and development and testing free of charge if SACO would commit to purchasing 150 units, which would help MOCO recoup their research and development costs. SACO was hesitant as they believed that the order was very large to commit to just one supplier; in return, MOCO stated there were several caveats in their contract that SACO could use if the quality or delivery was not right. Investment in research and development did not necessary guarantee orders. MOCO found it very tough to get SACO to commit to an order of 150 units. However, MOCO offered market complementarities through knowing many UK entities and government bodies involved in the OSW sector that helped convince SACO that MOCO was a feasible supplier. Participant 1-1-2: "This worked in our favour, we were advisor to the customer." This enabled SACO to sail through all the complexities of UK and Scottish governments and helped them secure the permission to build a prototype of their product in Scotland. The effort made by MOCO triggered the strengthening of their relationship with SACO. Participant 1-1-2: "We were trying to be very collaborative in our approach, so we did a lot of work and analyses free of charge."

SACO placed an order in November 2011, which was for two prototypes but with a commitment to purchase 150, with a caveat that if SACO did not build 150 turbines, MOCO could not claim for 150. If SACO would proceed to build the first 150, then MOCO would build the first 150 and then SACO would look to find a second supplier

depending on volumes and the current relationship with SACO. Participant 1-1-2: "We have given SACO a royalty-free license to build the product after 150 units have been built if they needed to." On reflection, the 150-unit contract relied heavily on the complementarity between technical capabilities of MOCO and market entry strategy of SACO. MOCO transferred technical complementarities by offering SACO a royalty free license to build their own gearboxes after the 150 units were delivered. However, when MOCO signed the contract with SACO they retained all of their IP, and gave SACO a license to build but they didn't give SACO the IP and detailed product drawings. Participant 1-1-2: "They have the right to manufacture our gearboxes in the future subject to rules and regulations. One thing about our company is we know what we are doing, one thing that we are told that is important is to retain our IP ... It's a difficult balance between giving the customer what you think is right and giving them enough information for them to go away and do it for themselves if they chose to."

MOCO had to convince the company board of directors to invest in all the equipment that was needed to build the prototypes and test rig for SACO. 20% of the supplier's investment in capital equipment came from funding from the UK government. The investment in the test rig did help move the relationship forward; during several meetings with key staff from both firms, MOCO would share all cost information with SACO to show how much of their investment was dedicated to their project. Participant 1-0-1: "This was one of the key decision makers for the agreement." SACO could not make certain decisions without going up the hierarchy. They had an existing set of terms and conditions that they were initially reluctant to change. MOCO had never done any work in offshore wind before; Participant 1-0-1: "When we sat down with SACO, we met in Aberdeen and agreed very quickly a structure of how we were going to work together." MOCO invested £30,000 in lawyers to draft the conditions of the contract and sent these to SACO, who returned them with the original terms and conditions they had set. This then involved a long two-month process of sending the edited terms and conditions back and forth until they were finally agreed. Participant 1-1-2: "It took a long time to put this in place." During the early-stage relationship building, several incompatibilities were discovered. SACO's culture of high expectations on responsiveness was the first challenge for MOCO. For instance, Participant 1-1-2: "We would tend to wake up to lots of emails from [SACO] and we would have until 10am to respond to them before they finished for the day ... They expect answers instantly; whenever they send an email, it has a deadline date for when we have to reply to them ... It is always a few days away if

not tomorrow.” There were also incompatibilities in terms of time difference between the partners which required MOCO to work overtime regularly to respond and question SACO personnel. Participant 1-1-2: "If I wanted a decision now, I wouldn't be able to get it until tomorrow morning, unless I phoned them at midnight.”

From the start of the relationship Participant 1-1-2 would dedicate all their time to the relationship with SACO; this allowed for fast responses to SACO's demands which impressed SACO and was a key factor in MOCO winning the order. However, several months into the project, Participant 1-1-2 started to work on or parts of MOCO's business not associated with SACO which increased the response time to SACO and resulted in SACO making a complaint. Participant 1-1-2: "As business development manager, I was going away trying to win business elsewhere, but being the key account manager, I couldn't respond as quick any more, as we had set the bar very high initially." MOCO found it hard to continue working at SACO's pace but made sacrifices to do so. Participant 1-1-2: "They are a difficult customer, they want things right, their expectations of us doing things quickly were very high, for instance, 'can you be at a meeting tomorrow? ... 'Can you get this report to us tomorrow?'" On many occasions MOCO staff would be required to sacrifice their weekends off to satisfy SACO's requests; this was something very unusual for the British staff at MOCO; Participant 1-1-3: "This was difficult for our guys as that's not the British way." MOCO found it very difficult to adapt to the differences in expectations in responsiveness and timescales; Participant 1-1-2: "Their expecting you to turn up to their factory (in Asia) with the drop of a hat ... You will receive an email on Thursday reading that they will be visiting our facility on Monday for an audit, then we are like, oh shit." MOCO recognized the problems owing to distance and responded to accommodate SACO as much as they could.

SACO's hierarchical organizational structure presented further challenges that MOCO were not used to. Participant 1-1-2: "The [SACO people] are quite difficult people to deal with, they are hierarchical, so the guy you're talking to can only make certain decision; if he can't, he has to defer to his boss, so he has to go away and come back." On many occasions, Participant 1-1-2 would fly to [Asia] for a three-day meeting with SACO staff but end up having to delay the plane and stay for a further three days, only to return a couple of weeks later. The differences in hierarchical structures between the two companies made doing business a lot harder per MOCO. Participant 1-1-2: "They tend to work in silos, so you have to check with different people as to what is going on before making a decision. So, making decisions takes a lot longer." MOCO experienced issues

in communication with SACO where they would be communicating with different offices of SACO: SACO had an office in Scotland, one in Hamburg, and one in Korea. Participant 1-1-2: "Sometimes you get information from different parts, mixed messages, engineering will say one thing then production will say another, but only the office in Korea can give the go-ahead."

Participant 1-1-2 visited SACO's HQ in Asia at least six times a year, and would bring technical staff, lawyers, Participant 1-0-1, and other MOCO staff on each visit. Participant 1-1-2: "There was a large spectrum of people involved from both sides." Due to the difficulties in distance between the firms, SACO decided to open an office in Hamburg to make communication easier and travelling times shorter for the two firms, but also to be closer to the market and poach experienced staff from the offshore wind industry in Europe. Meetings between the partners in Hamburg involved SACO bringing in crane operators and other external companies to the meetings to explain how they would be fitting MOCO's gearbox into their turbine, and to discuss the best methods for constructing it correctly and with speed. Sometimes language would be an issue in the relationship: while most of SACO's staff spoke English, none of MOCO's staff spoke Korean, which led to some slight misunderstandings during some of their meetings. MOCO overcame this by hiring a translator from Scottish Development (SDI) who was based in Korea and would join MOCO staff in their meetings when visiting SACO's headquarters. MOCO invited SACO to their parent company HQ in Finland to demonstrate the quality of their manufacturing facility which impressed SACO. From the ongoing visits and regular communication throughout the relationship, MOCO was able to secure SACO's trust: Participant 1-1-2: "When they say they are going to do something they do it, they won't lie to you ... Some things they said they would do, we never thought they would do, but they did! ... They were true to their word." MOCO also found that SACO's culture was one of honour, which was an important factor in terms of trust in their relationship; Participant 1-0-1: "They don't deceive you."

MOCO built the first two prototypes over two years. During the building process SACO had multiple staff based at MOCO HQ working alongside MOCO's technical and shop floor staff. Participant 1-1-2: "The action plan has changed a lot, because originally the timescales were very tight, and the problem we had was that SACO wouldn't change the end date but the negotiations took a lot longer so we ended up compressing the design and manufacturing time. ... In the end, we didn't achieve the timescales set out: we were late in the delivery of the gearboxes." However, despite the late delivery, MOCO had

demonstrated their ability to produce a working prototype in an impressive timescale; Participant 1-1-3: “We designed and built two gearboxes and a test rig in 9 months. By industry standards that’s fantastic!” The gearbox was delivered to Korea and stayed there for several months until MOCO helped SACO receive planning permission to build a test rig in Scotland. However, during the time the gearbox was at SACO’s facility, SACO decided to change the design of turbine: the rotor blades were made longer than originally proposed. Due to the changes being made after the planning permission was awarded, the planning permission became void, which delayed the project significantly. Another factor that delayed the project was bad weather, which halted the movement of the foundation for SACO’s turbine from one part of Scotland to the test rig site. Participant 1-1-2: “So our gearbox ended up sitting in a warehouse in Korea, even though it was late from us ... When dealing with prototypes, they take a lot longer to manufacture than you would expect, lots of things go wrong.”

Expansion stage

Shortly after the planning permission in Scotland was made void, SACO received planning permission to install 12 turbines in a demonstration site in Korea; this then resulted in an order to MOCO for gearboxes. Participant 1-1-3 proceeded to contact their suppliers to purchase the raw material required to build the next 12 gearboxes. Shortly after receiving the order MOCO completed the construction process for the two prototypes; they then shipped both prototypes to SACO’s HQ along with a large group of MOCO technical staff. SACO then installed the gearboxes into their turbines to test them with MOCO staff. SACO then shipped them back to MOCO where one was installed in a turbine in Scotland and the other in a drive train at the UK national renewable energy centre. Participant 1-1-2: "During various stages of the build we had people on site (Scottish site), to help out when the blades were being installed. When assembling the blades to the gearbox, the gearbox needs to be turned while inserting blades. In terms of torque and force this is the worst-case scenario for something to go wrong – this is when the highest amount of torque is put on the gearbox, and there is a lot more force on the gearbox during this stage than when the turbine is in operation. So, we had people there ensuring it was then correctly lubricated, that the gearbox turned when it should be turned, and stopped when it should be stopped.” Due to the radical design of SACO’s turbine, MOCO realized it would be hard to replace SACO as a customer, as other potential customers had already invested in turbine designs with a well-designed gearbox to work with it. The gearboxes are not interchangeable and so MOCO did not have another

potential customer to serve with its gearbox design. Despite the incompatibilities between them, both parties invested heavily in relationship specific assets.

MOCO experienced many difficulties when preparing their first prototype order for SACO. The big flange the gearbox fits into, that MOCO supplied for the prototype, was too small on the bore. Thus, SACO had to machine it out and repaint it, and then charged MOCO for it. Because of the limitations on shipping, MOCO sent out one gearbox complete (65t); the second gearbox was shipped in three parts; due to shipping requirements (the way containers were stacked on ships), they sent people out to put the parts back together. Although the relationship had informal aspects to it, there were some formalities; for instance, Participant 1-1-2: “When things go wrong, when we were late we had to pay some damages, so they did look back on the Ts and Cs, any quality issues, they have come back to us saying they have had to rectify this problem and asked us to pay the cost.”, MOCO provided further complementary resources to SACO by helping them in their sales activities, visiting SACO’s potential customers and sending along MOCO’s engineers to explain their gearbox in detail. Participant 1-0-1: “We have had SACO customers visit our site to show them our test rig. When we had the two gearboxes in the facility, we spun them in the test rig in front of RWE, DONG, to show them the gearboxes operating. We put the costs down on the table and then took them off, as it showed SACO, ‘This is our investment into your project’. That went down well, and was one of the key decision makers for the agreement. That and the fact we were going to help them establish themselves in the UK ... These were the two triggers for strengthening our relationship.”

Around the summer of 2013, SACO put the contract for 12 units on hold because they were having problems securing planning permission at the test site in Korea. They had issues with military radar, also due to the area being close to a holiday tourist destination. This introduced much uncertainty into the relationship as to what would happen next between the partners. Participant 1-0-1: “We know that SACO are potentially dropping out of the market. We [MOCO] have other customers. One of the challenges for us is the time it takes to get from prototype to serial production, and also the length of time it has taken to get customers to have the confidence to invest in the UK. We have only just seen SICO commit, and not even fully. When we started doing this in 2010, we expected to be in a factory next to SACO building 100 turbines a year. Of course, we are not, no one is doing that. SICO and Vestas are supplying the market from Denmark, there’s hardly any UK manufacturing.”

Dissolution stage

In mid-2013 SACO's order for 12 gearboxes that MOCO had already started to manufacture was cancelled. MOCO had already built two and tested them at their facility; the next four sat in their warehouse in various stages of production and the four units after that were in various parts of the supply chain. SACO decided to cancel their demonstration project and made attempts to cancel the order with their customer; if successful they would cancel their order with MOCO, reported Participant 1-0-1: "We will then have to come to some agreement on compensation for the 12 units. The first two were delivered and paid for." The challenge for MOCO after SACO's order cancellation had been the length of time the whole project lasted, particularly as the Director had to convince MOCO's board to keep funding the project. Participant 1-0-1: "Year after year we have said we will get some orders the next year to them ... In an ideal world, it was for SACO to be setting up a factory in the UK, and for us to build a factory alongside it, for us to build gearboxes alongside so we could push straight into SACO's turbine factory. At the moment, their business is going through a big review as to whether they see a future in the wind industry. Whether the design is right, whether the market is still big enough to take a major player, so we need to wait and see."

The gearbox MOCO had developed for SACO was very radical, which introduced several issues; Participant 1-1-2: "The gearbox sits in the nose of the turbine and the turbine spins outside of the gearbox instead of having a train. Because of that, the gearbox is mounted inside two big bearings. When the gearbox is taken out, they collapse and go oval because of the pure weight and size of the assembly; also, due to the complexity of the bearings, they are very expensive to make and so the proposed SACO design is not a viable design." Given that the gearbox designed by MOCO was not viable, they continued to work with SACO and spent January to March 2014 undertaking a large study on whether a 7MW model would be big enough, concluding that 8 MW would be better for SACO in terms of the levelised cost of energy. Participant 1-0-1: "We did some concept work at 8MW for them. So, it may be that SACO decide to abandon the 7MW project and develop an 8MW prototype, we don't know. They might decide to pull out altogether or they might decide to slow down the project and come back later, but they would lose ground to the other OSW OEMs." Participant 1-1-2 explained that there were written contracts between the parties; however, they did not expect to refer to them very often: "Now, as it seems we will be closing the deal, we will have to refer to it a lot more closely because of the termination clauses in it. We haven't picked up the terms and conditions since signing

them.” Because of the cancellation, MOCO had lots of stock tied up in turbine parts and SACO decided that the costs were so high that they wanted to terminate their obligation, and so asked MOCO to provide information on all of the costs incurred for the project. Participant 1-0-1: “We are still working together, but to a negative end, rather than a positive ... The relationship is still good but now the business opportunities are limited ... Our business is in decline but our relationship isn’t.”

When Participant 1-0-1 was asked about their thoughts on SACO entering the UK market after all the setbacks experienced, they were not positive and even suggested that SACO may leave the OSW industry altogether or at least slow down the development of their OSW products. It was clear that the original order for 12 units would no longer be going ahead, as well as the installation of SACO’s turbine at the test site in Scotland. MOCO now aimed to develop new customer relationships in the OSW sector. Due to the long length of time spent on developing their relationship with SACO, MOCO was now hoping to become a second source of supply for OEMs who already had supply chains in place. MOCO also planned to focus more on the onshore wind markets, in particular, the service and repair business, and prepared to move the staff they had working on the SACO project to the service and repair business. Participant 1-1-2: “On a scale of one to seven I would say five. It has been hard but we are making a difficult product and they have a difficult business. We don’t expect them to be our best friends, but they have been quite a good customer. We’ve had lots of issues as you would do building a prototype that size, but they have not been unreasonable.”

Participant 1-1-2: “We will probably end up throwing all the parts we’ve made away, and cancelling all the existing orders for parts and maybe placing orders for a different design of the same component. If they were still speaking to us ... We have been paid for the two prototypes we supplied; they have also given us deposits on another twelve, but they will only pay you when they see that everything is 100% right. There are some differences between when we expected payment and when we got payment.” It was now too late for MOCO to expect another customer to take the place of SACO: there were very few OEMs in the market, and those who were in the market had already developed their own nacelles and drivetrains and would be very unlikely to invest the significant amount of capital required to develop a gearbox with MOCO. Participant 1-1-2: “Because our product is such a radical design, anybody [OEMs] who has something of the same size and scope will already have a well-designed gearbox and they won’t be interchangeable. So, there

is not a potential customer for us.” Figure 11 below illustrates MOCO and SACOs relationship development trajectory.

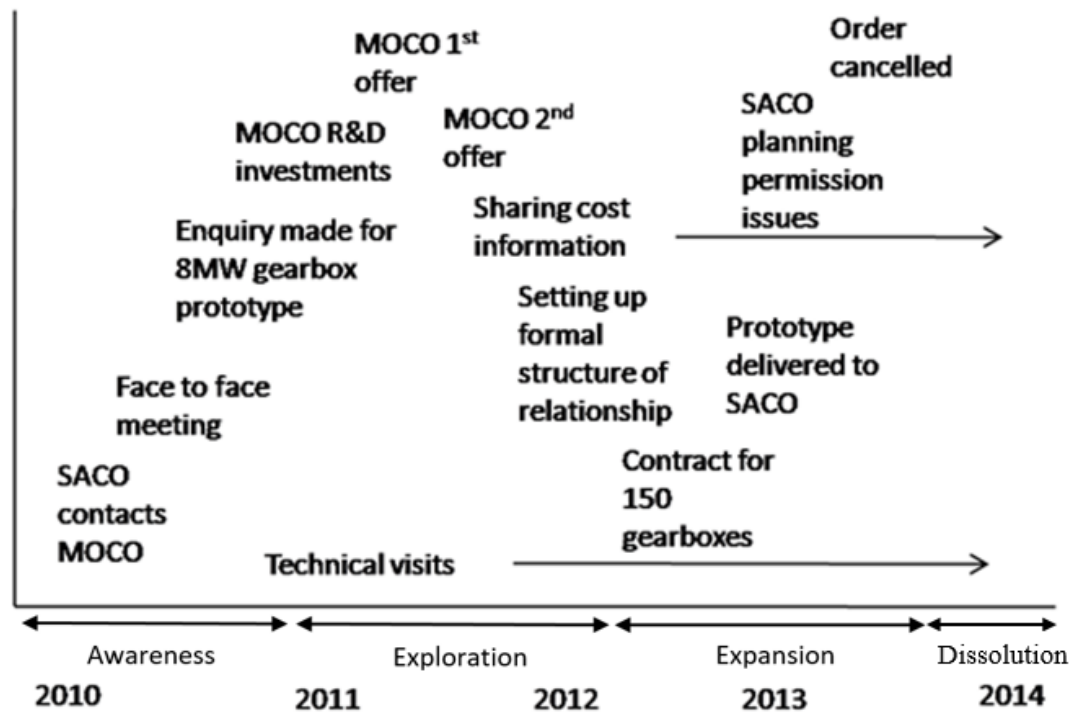


Figure 11 MOCO and SACO relationship development timeline

4.1.1.2 Case #1.2

This case examines the relationship between MOCO (focal buyer) and VICO the supplier. The case is primarily informed by the following participants: 1-0-1 as MOCO’s UK director; 1-1-2: MOCO’s key account manager; 1-1-3: MOCO’s supply chain director and key account manager and 1-1-4: MOCO’s technical product manager. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

VICO was a company founded in 1918 in the Czech Republic with a long heritage and experience in manufacturing gears and mechanical gearboxes for a wide range of industries, including industrial applications, railway vehicles, oil and gas extraction, and wind turbines. With strong development and state-of-the-art production facilities in the Czech Republic, VICO have 800 employees and an annual turnover of €75 million. Before MOCO acquired DACO, DACO had contracted VICO to supply 14 carriers for their OSW turbine gearboxes. VICO’s contribution to each gearbox ordered came to approximately €800,000 per gearbox. After the acquisition of DACO by MOCO, VICO had already supplied the carriers for five gearbox sets. The novation of contracts needed

to be renegotiated; in order for VICO to accept the novation of the contract, they played hard ball, and persuaded MOCO to pay them upfront in three stage payments, for the remaining four gearbox sets up to gearbox ten.

Awareness stage

After the acquisition of DACO by MOCO, the newly appointed MOCO supply chain manager visited VICO to re-establish relations and the novation of contracts that had been made previously by staff at DACO. Since DACO became a part of MOCO, the exploration stage mainly involved re-establishing the existing relationship. However, the existing relationship was troubled by an outstanding purchase order. DACO had originally given them a purchase order for fourteen gearboxes, but with no specific call-off dates. VICO told MOCO that whether they wanted the component or not, or whether they delivered them or not, they demanded payment upfront by February 2014, for 10 sets.

Exploration stage

In this case, the exploration stage involved mainly efforts to resolve conflict. Initially, there was a lack of communication regarding the relationship with VICO when MOCO took over VICO. Participant 1-1-2 explained how he wasn't made aware of the upfront payment demanded by VICO; when he met and spoke to VICO's sales manager, they would ask for the bearings for the raceways they were manufacturing to be supplied by MOCO, for them to complete the gearbox assembly. However, MOCO was not expecting to receive payment from their customer SACO and so decided not to send the bearings they had already paid for to VICO, as MOCO's customer SACO looked unlikely to proceed with the gearbox order. If SACO were to cancel their order, MOCO's key account manager suggested that VICO would keep their settlement payment and value the components at their facility owned by MOCO, in order for MOCO to gain back a scrap value price on the metal. Participant 1-1-2: "We ended up paying well over £1m for something that we still have not received today ... They are sat on the money, they have the parts part manufactured, and we have said to them, 'Don't do any more, don't put any effort into them, as we are likely to not want them.'"

The efforts toward the exploration stage began by resolving several issues. First, some complicated technical disputes between the components supplied by VICO and SKFCO had to be resolved to reach technical compatibility. Second, the trust between VICO and MOCO had to be built up while they had been competing as well as cooperating with

each other. VICO and MOCO had both made bids to the same customer [SACO] to be the preferred supplier of the complete gearbox; however, MOCO was chosen ahead of VICO and then subcontracted the work to VICO. This had a massive impact on the level of trust between the organizations; Participant 1-1-3: “It is a wary relationship. On a personal level, excellent, nice people, good to work with, very amenable. But there is a certain level of wariness as they were originally considered as a supplier to the complete gearbox, and we were chosen ahead of them and then subcontracted some of the work to them ... So, in effect, they wanted to be the lead manufacturer and were eventually chosen as the second-tier supplier ... The reason why we have to be wary is that potentially they could be undermining us in order to win that business. Later, we started to think that was a possibility.”

This was emphasized when MOCO’s director, Participant 1-0-1, referred to his experience with technical issues with the components involved in the relationships of VICO and another firm SKCO. VICO produced raceways for the gearbox that housed the bearings; the bearings were manufactured by another company, SKCO. SKCO specified the shape and form of the raceways that were then manufactured by VICO. Once the raceways were manufactured and delivered to MOCO, SKCO visited MOCO’s facility to inspect the raceways and test the running patterns once they were under strain in the gearbox. There was a dispute about whether the raceways VICO manufactured were acceptable, or whether SKFCO had provided acceptable measurements for the raceway. Thus, there had been a long-running engineering discussion between the three firms to understand whether it had been a machining error on VICO’s part or a design error made by SKCO.

The technical disputes between MOCO and VICO had an impact on the level of trust in each other, to the point where the relationship was near to non-existent. When asked about the latest development in the relationship with VICO, MOCO’s director, Participant 1-0-1 commented: “It has all gone very quiet, in effect we have said we don’t want you to do anything; leave all the manufactured parts in a corner and we will speak to you again when we know something. We haven’t spoken to them for three months; we are now waiting for a word from SACO (the customer).” However, despite some of the mistrust and disputes, MOCO’s key account manager felt that VICO would provide help to them if asked, which was not the case when compared with other MOCO suppliers mentioned in this case who had a “take it or leave it!” attitude. Participant 1-1-3 explained that VICO was MOCO’s sole supplier; however, they were looking to replace them with their sister

company located in Finland. He explained that MOCO started to look at the manufacturing process involved in the component and concluded: it was a very complex product that had patented technology unique to MOCO. With a lot of production engineering and engineering effort, MOCO, through their sister company, would be able to take over the manufacturing of these parts. There would be clear advantages of keeping this manufacturing process in-house. However, with MOCO's sister company being based in Finland and VICO being based in the Czech Republic, a low wage economy, staff wanted to start a cost-based analysis to see how competitive the price would be from both suppliers.

MOCO experienced problems with VICO's product around the middle/towards the end of 2013: one problem was from rust due to packaging issues. As the situation with MOCO's customer put a hold on MOCO's operations, the parts they had ordered from VICO were sitting still in their factory, and due to insufficient packaging, the parts had standstill corrosion issues, where the bearings had been standing still and not moving, which led to a scuffing effect taking place, as well as a migration of moisture to contact areas. Participant 1-1-4, a technical engineer, stated that this was a big issue. However, this brought the two companies closer together as they started a joint initiative to understand where the corrosion was taking place: whether it was before the product left VICO's factory, during transit, or when it arrived at MOCO's facility.

After several meetings and discussions over the phone, both companies concluded that the parts supplied were not protected/packaged well enough. Part of the corrosion was caused by putting the assemblies into a sealed bag, using silica gel which they tied with string to the spray nozzles. The moisture would then be drawn to the silica bag which was tied next to the metal surface of the spray nozzle, in effect drawing all the moisture exactly where it was not needed. Thus, silica gel is no longer placed near the metal surfaces any more. Another issue that arose was that VICO would apply light machine oil to the assemblies before sending to them to MOCO. MOCO's technical product manager. Participant 1-1-4, explained that he was responsible for finding the solution to the problem, which was that light machine oil was not enough, as the film layer would break down; he explained this to VICO technical staff who then applied a more substantial oil to the assemblies. Participant 1-1-4 also suggested that VICO use two bags instead of one when packaging the assemblies, as if one was perforated, there would be another in place to ensure an air-tight seal. VICO also made investments into the relationship with MOCO; VICO invested in improving the transportation of their assemblies to MOCO.

They had a purpose-built steel skid, as the diameter of the components is so large that they cannot put them on a wagon and transport them on UK roads, so they had support pallet made, where they are lowered on and strapped on at 45 degrees.

Dissolution stage

Despite the improvements made to logistics and operations between the two companies, the relationship moved into the dissolution stage, due to MOCO not receiving the order they had hoped for. Figure 12 illustrates the relationship development timeline between MOCO and VICO.

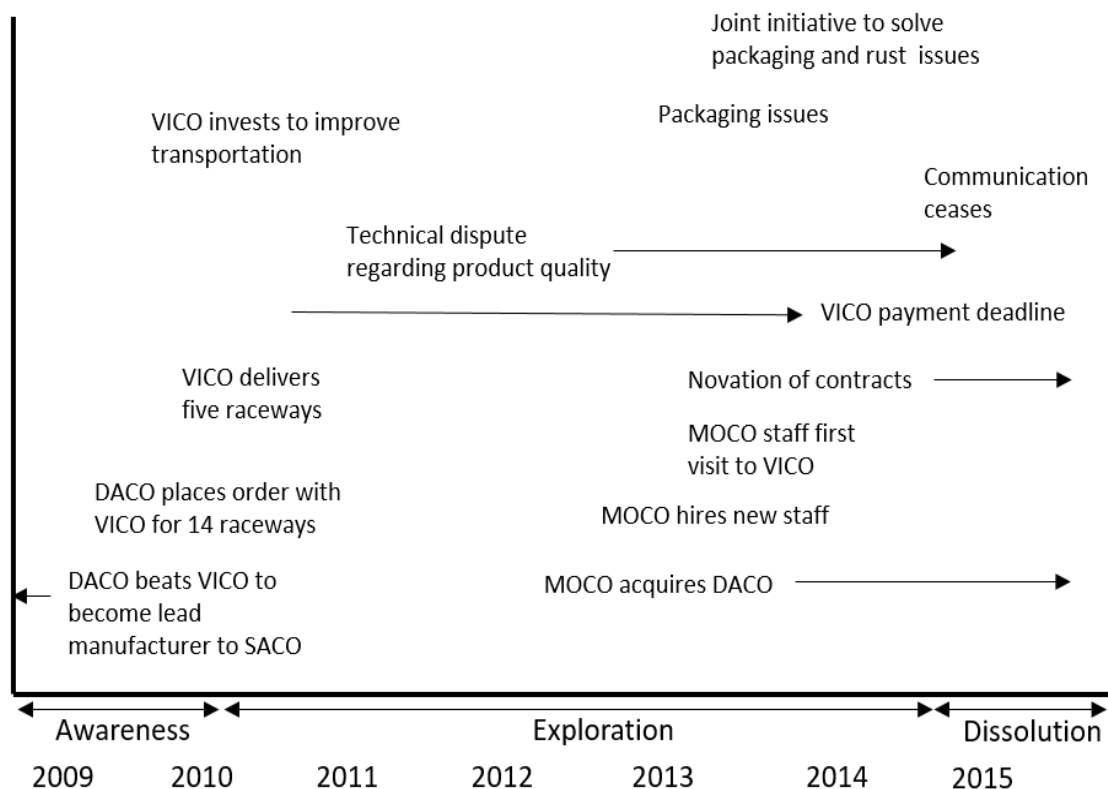


Figure 12 MOCO – VICO relationship development timeline

4.1.1.3 Case #1.3

This case examines the relationship between MOCO (focal buyer) and COCO the supplier. The case is primarily informed by the following participants: 1-0-1 as MOCO's UK director; 1-1-2: MOCO's key account manager; 1-1-3: and MOCO's supply chain director and key account manager. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

MOCO required a foundry that could provide castings for their gearbox. The problem was that there were very few foundries in the UK that could supply a casting of the size required by MOCO. COCO was a casting manufacturer founded over 100 years ago in the North of the UK with an eight-acre site and 80,000 square feet facility. COCO was the UK leader in large and heavy castings, supplying to numerous industries including nuclear, marine, shipping power generation, automotive, tunnelling, and green-energy. COCO had approximately 80 employees and an annualized turnover of £8 million; they also put strong emphasis on being a British manufacturer. COCO was considered a sole supplier in the UK by MOCO; alternative suppliers would be Europe-based or beyond Europe.

Awareness Stage

Before going into administration, there was an ongoing relationship between MOCO and COCO, but it was troubled by some quality problems and outstanding payment, in addition to the administration. Participant 1-1-3 mentioned a specific challenge with this relationship when, in early 2014, COCO went into administration. At the same time, MOCO were negotiating some serious quality problems on the component COCO had supplied. The product in question was a three tonne 2.9m diameter ring. MOCO had found metallurgic problems with the components COCO delivered and so were in the process of rejecting them and requiring replacements at the time of the sale. MOCO had to negotiate with the administrators of the previous company; in effect, MOCO owed them £40,000 for the parts they supplied, and MOCO were refusing to pay as the parts were defective. The supplier was supposed to be supplying replacements, for which, if received, MOCO would have had to pay the £40,000. This resulted with the supplier's administrators issuing invoices for £40,000, which led to protracted negotiations with the administrators, ending with a settlement.

Exploration Stage

MOCO were in a sticky situation as, if COCO did go into administration, MOCO would be left without a supplier and the components they had received would have been useless. At this point, MOCO realized they could no longer rely on one source of supply, so they identified several alternative suppliers. Also, due to the size of the component required, MOCO found it hard to find another suitable foundry in the UK; however, COCO was a foundry based in the UK who had made an agreement with DACO who were then acquired by MOCO. Thus, there were no existing ties in place with MOCO's supply chain

manager and staff at COCO. MOCO then proceeded to meet with the new owner and explain the problems they had experienced previously. The bond initially made between the new owner and staff at MOCO was very strong and positive. The new owner of COCO stated his intent to work out the problems MOCO had experienced previously and expressed his interest in working with MOCO in the future. The efforts to expand the existing relationship started immediately between MOCO and the new owners of COCO foundry; MOCO made orders for new parts to replace the faulty ones. COCO was bought by a large manufacturer with large machining capability and capacity as well as some small foundry capacity that could offer MOCO the sizes required for their gearbox.

MOCO's technical product manager explained that there were two foundries responsible for supplying various castings which were initially set up to provide the finished article. These were COCO as mentioned, and SECO. SECO was a small foundry in Somerset that provided MOCO with small castings. SECO subcontracted their machining to a company in the Midlands; they then delivered the finished product to MOCO from the SECO facility. To provide the complete finished product, the foundries would cast the components, which would then need machining. Depending on which process had higher value, i.e., the casting or machining, the supplier providing the higher value process would take the lead role and subcontract the lower value process to the other. The castings were of higher value compared to the machining and so the foundries undertook the role of main contractor. Due to the quality issues with the measurements, material properties, and tolerances of the castings MOCO received from COCO, MOCO had lost their trust in COCO and so decided to take responsibility for subcontracting the work, rather than COCO. The machining was subcontracted to a company named ADCO in Manchester, who machined the component and sent it back to MOCO facilities. This introduced more challenges for MOCO as MOCO's key account manager (Participant 1-1-2) explained: "The obvious problem with that is that you are now taking responsibility for the machining taking place; if they scrap that then it's our liability. So similarly, if your supplying foundry provide defective material and you have subcontracted them, again that's your liability. If you put the responsibility on one company to provide the finished article, it's their problem if there are any quality issue or problems. That has been a lesson learnt, that cost us a great deal!" MOCO's director, Participant 1-0-1: "Going forward, we want to purchase the finished article; we don't want any of the intermediate problems, just deliver the finished article."

Dissolution Stage

MOCO did contract some work to ADCO; however, they came across quality issues with the component that they supplied. MOCO's technical staff worked closely with ADCO technical product team to improve the quality of ADCO's product which involved an audit of SDCO's facility. After the audit, MOCO concluded that ADCO did not have the ability to deliver on what they said they promised. The issue was with the accuracy of ADCO's measuring equipment which MOCO said could not meet their high standards. ADCO simply said that the equipment would produce the component to the correct measurements; however, MOCO disagreed but could not prove them wrong. So MOCO decided to subcontract to another company to measure one of their components and compare it with ADCO's. MOCO found that the results between the two were widely different and proved that ADCO's machining equipment was not accurate enough to meet offshore wind standards and be used by MOCO. Participant 1-1-3 mentioned ADCO's response: "What we've got is what you get and if that isn't good enough, you can go elsewhere. Like it or lump it." They further commented that if MOCO were to place any more orders, they would not be going back to ADCO: "Their response should have been, in order to keep this business, we will upgrade our measuring equipment, and until we get, we won't supply anymore ... it was an unusual attitude to have but I think, over the years, they've had so much pushback and grief from the company, they were quite happy to walk away from it." Figure 13 illustrates the relationship development timeline between MOCO and COCO.

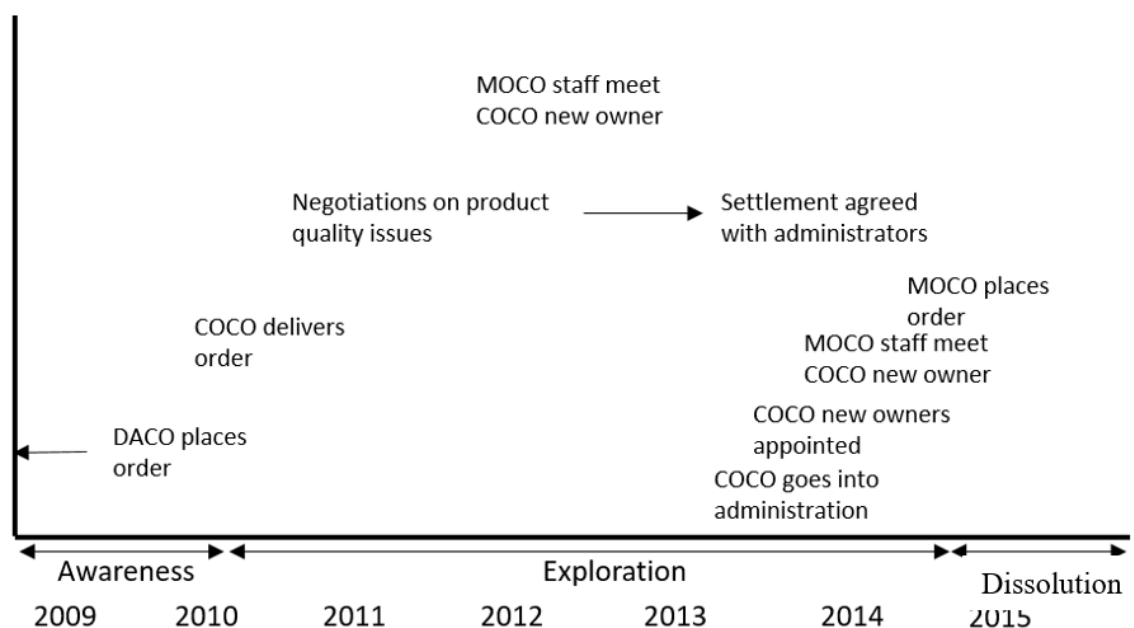


Figure 13 MOCO – COCO relationship development timeline

4.1.1.4 Case #1.4

This case examines the relationship between MOCO (focal buyer) and SKCO the supplier. The case is primarily informed by the following participants: 1-0-1 as MOCO's UK director; 1-1-2: MOCO's key account manager; 1-1-3: and MOCO's supply chain director and key account manager. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

SKCO is a Swedish company, and the largest bearings manufacturer in the world. SKCO started manufacturing bearings for the offshore wind sector in 1981. Despite such long history in offshore wind, wind is only a small part of SKCO's total revenues. Their operating income in 2014 was 7.8 billion SEK and total number of employees amounted to 48,953. While there were other suppliers MOCO could choose from, SKCO served bearings to 50% of the global offshore wind market.

Awareness stage

The relationship first began in 2009 when DACO staff contacted and met with SKCO to enquire about sourcing bearings for their gearbox. After meeting, the two companies agreed and set common working routines for their future relationship. However, the relationship ground to a halt when DACO was acquired by MOCO. In 2013, the newly formed MOCO and its one-man supply chain leader met with SKCO to revitalize the relationship and set new agreements as to how they would work together in the future. After meeting SKCO, MOCO was satisfied with the capabilities and experience of SKCO so decided to place an order; this moved the relationship into the exploration stage.

Exploration stage

When both components were delivered, MOCO began the process of testing the gearboxes. This involved stripping the gearboxes down and inspecting the raceways; at that point, SKCO came down to MOCO's facilities, as they wanted to see what sort of running patterns their product was getting once under strain in the gearbox. There was a dispute about whether SKCO had made the bearings to the right form and shape, or whether the predicted shape was not acceptable for the gearbox. MOCO's director (Participant 1-0-1) commented on the state of affairs with SKCO: "There has been a long-running engineering discussion, rather than a dispute; a lot of work and effort has gone into understanding whether it's a machining error or a design error." The progression of the relationship towards the expansion stage was affected by technical disputes. When an

issue with the bearings was raised by MOCO, SKCO sent their technical team over to MOCO facility to test and analyse the problem, to prove that the problem existed after they had delivered it to MOCO.

SKCO tested the bearings MOCO had received and had in stock, and there was no evidence to suggest that the bearings had been used in any other application, so MOCO had to conclude that any issues with the bearings came after they had been delivered by SKCO. This meant the issue was to be disputed between MOCO and VICO, who had made the raceways which housed the bearings. MOCO faced the challenge that, if there was a problem, they would struggle to prove that the problem existed before they installed and used the bearings. From SKCO's testing of the bearings MOCO had in stock, there was no evidence that they were used in any other application, so MOCO had to conclude that the issues did not lie within SKCO responsibilities, as the problem with the product would have likely happened after MOCO had received them.

The technical issues between MOCO and SKCO had affected the ways the relationship between the two companies expanded. When asked about the relationship with SKCO Participant 1-1-2 explained: "Nothing is ever the fault of SKCO, where everything SKCO provided was apparently correct, anything that is wrong with it is how MOCO have used it, stored it, or specified it." MOCO found this a challenge to prove that any problems with the bearings supplied were through the fault of SKCO. The main issue was that MOCO's technical capability was lagging behind SKCO. While the SKCO's high level of technical capability was complementary to MOCO, the lack of compatibility between the two companies in terms of technical capability became a barrier affecting the exploration stage. To resolve the technical dispute, SKCO invested in an investigation. Participant 1-1-2 commented on SKCO: "They are highly technical, they send in a technical team to analyse a problem, and then think of an excuse why it's not their fault."

Dissolution stage

Participant 1-1-3 commented on the relationship with SKCO: "We have technical issues with them, but we get on fine with the people; however, we are still trying to resolve the technical issues." There appeared to be a high level of good will (trust) for resolving the technical dispute. Along with the technical disputes came payment disputes, which became the main barrier for the relationship progressing to the expansion stage; Participant 1-0-1: "They have invoices outstanding with us for a lot of bearings they have supplied; however, we are not in the position to pay their invoices as we have not been

paid by our customer. They are piggy in the middle, just the same as we are.” MOCO did want to run pilot projects with SKCO, but the financial situation and state of affairs prevented them from doing so. Participant 1-0-1: “Inevitably, it will be a phone call saying the project is cancelled. Hopefully, we will be able to compensate you for any losses when we get compensated.” Figure 14 illustrates the relationship development timeline between MOCO and SKCO.

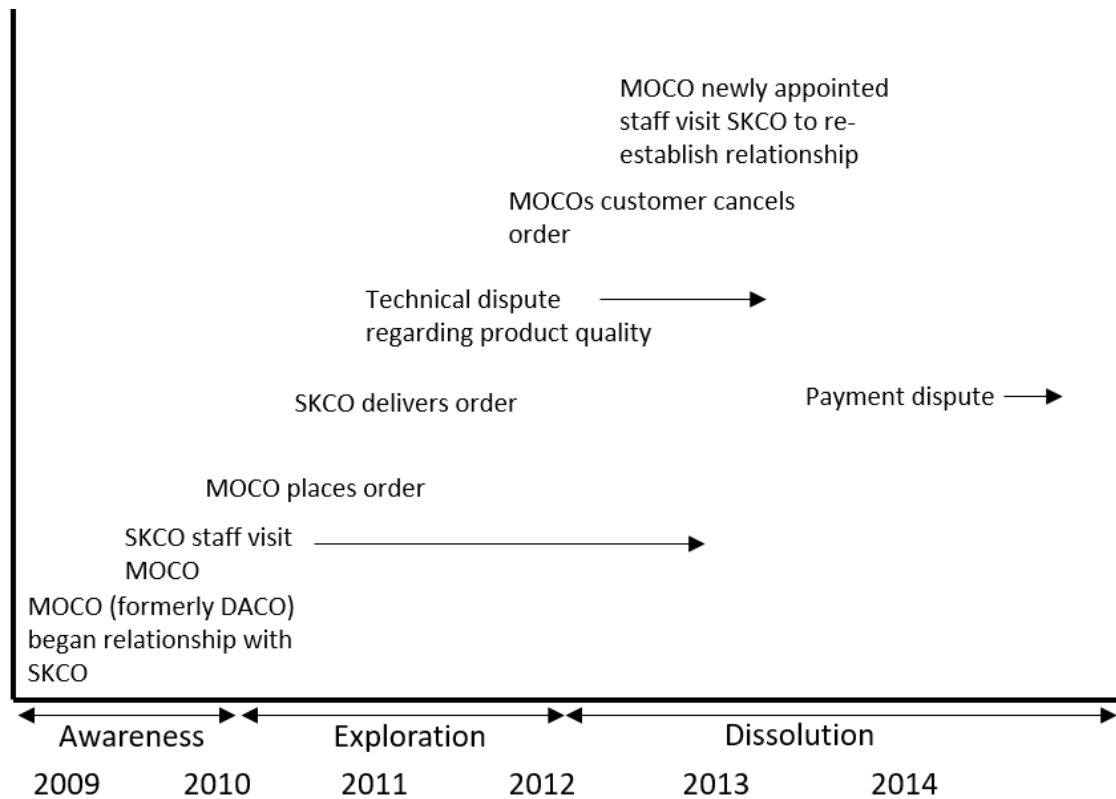


Figure 14 MOCO – SKCO relationship development timeline

4.1.1.5 Case #1.5

This case examines the relationship between MOCO (focal buyer) and OTCO the supplier. The case is primarily informed by the following participants: 1-0-1 as MOCO’s UK director; 1-1-2: MOCO’s key account manager; 1-1-3: MOCO’s supply chain director and key account manager and 1-1-4: MOCO’s technical product manager. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

OTCO is a German, family-owned company with more than 50 years of gear manufacturing experience. OTCO was one of the first manufacturers to supply parts for offshore wind gearboxes. Their facility in Germany is 9500m², in which they manufacture a range of products for wage teeth, patented precision worm gear, prototype parts, and

spare parts. OTCO are known for their strong history and well-regarded technical knowledge. There were limited other suppliers MOCO could choose from with the level of capability and competence of OTCO.

Awareness stage

The relationship started in 2009 with OTCO, when DACO contacted OTCO for the supply of Annulus rings. MOCO issued OTCO with a purchase order to manufacture 14 gearbox sets, comprising of three rings per gearbox set. MOCO decided to contact OTCO due to their strong technological and market complementariness: namely, that they had a lot of experience in manufacturing gearbox sets for the offshore wind sector. OTCO could also manufacture prototypes of new products which was of importance to MOCO. Several MOCO staff visited OTCO's facilities in Germany to conduct quality inspections and negotiate prices for 14 gearbox sets to be manufactured over five years. Both companies came to an agreement and the relationship moved to the exploration stage.

Exploration stage

OTCO and MOCO worked closely together over four years, sending staff from its headquarters in Germany on regular visits to MOCO facilities, and also facilitating knowledge transfer by accommodating MOCO staff at their factory, and training them on the processes and quality checks involved. This helped reassure MOCO about the capabilities of OTCO in the offshore wind industry, also, MOCO could trust OTCO to complete the work not only on time but to the quality standards MOCO had in place. This improved the technical capabilities of MOCO's staff, who could transfer some of the specific capabilities back to their UK operations. There were never any quality or delivery problems reported with OTCO's products and services during the manufacturing and delivery of the gearbox sets.

Given OTCO's strong technical capability, it was a suitable supplier for MOCO to continue to expand their relationship with. However, OTCO did not need MOCO as much; Participant 1-0-1: "OTCO are very much their own outfit; the OTCO relationship is, 'You place an order, we will deliver,' hands-off approach; if you want to know anything else, sorry.' OTCO are a family-owned company and very confident of their position in the market, they are specialists and have a thriving market and are not worried about competition. The owner of OTCO showed us his factory, and was very proud, he said if we wanted to place an order then go ahead; if not, then go elsewhere. He made it clear that he didn't need us as much as we needed him." OTCO offered technical, product

and market complementariness to MOCO, whilst MOCO did not have any complementariness to offer OTCO. In terms of compatibility between the two companies, there were some similarities in European cultures, where in both German and UK cultures, importance was paid to delivering a project in time. However, there were few personal relationships developed between the staff of both companies, despite staff working together at MOCO's facility as well as OTCO's on and off for four years.

Dissolution stage

Two years after MOCO's order, OTCO had manufactured and delivered six gearbox sets, and MOCO was satisfied with the quality. Towards the end of 2011, MOCO's customer SACO decided to cancel their order for MOCO's gearboxes. Consequently, MOCO had to contact OTCO to share the bad news. MOCO staff visited OTCO at their facilities in Germany to re-establish relationships and negotiate the novation of contracts, in which OTCO did not negotiate a deal like MOCO's other supplier VICO, where they wanted paying upfront. Therefore, MOCO told OTCO that they would no longer want any more gearbox sets to be manufactured unless they told OTCO otherwise. In response, OTCO demanded that MOCO pay for all the raw material they pre-purchased to manufacture the next four sets of gearboxes, worth £100,000. MOCO explained that they could not pay OTCO as they had not been reimbursed by their customer SACO; Participant 1-0-1: "There is the potential to take that into law. In the meantime, we are going to put a compensation claim to SACO that will cover the purchasing of this material, and if SACO pay the compensation claim, then we can pass that onto OTCO and everybody will be happy." The relationship between MOCO and OTCO stalled and communication between the two companies broke down. Both companies are waiting for their dispute to be resolved. Figure 15 illustrates the relationship development timeline between MOCO and OTCO.

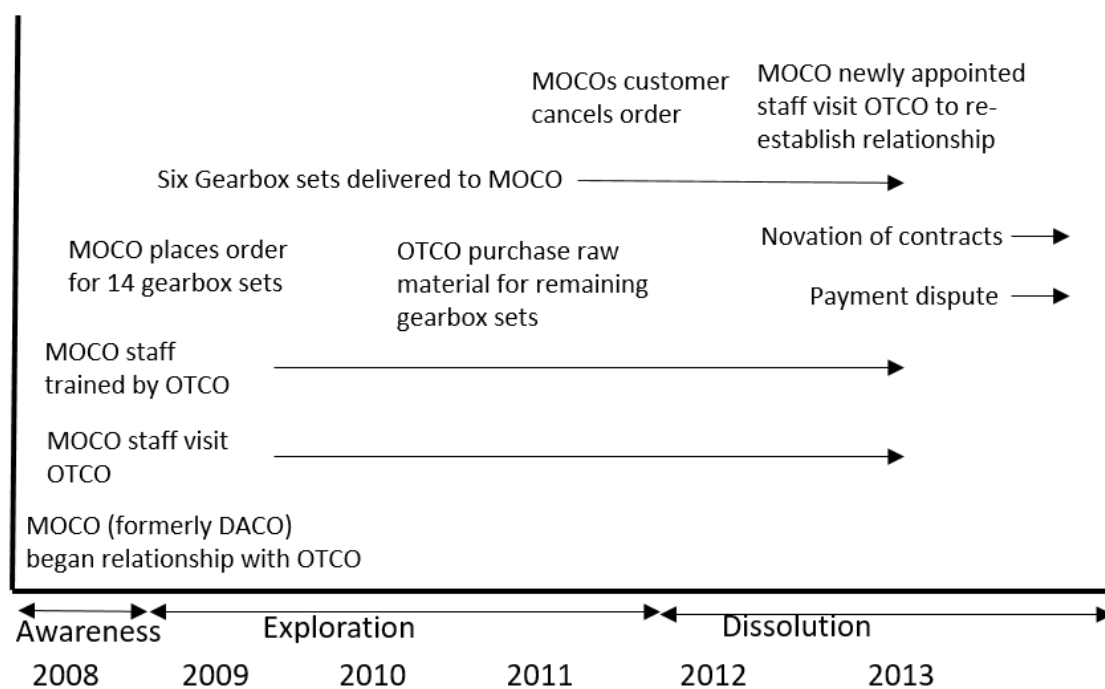


Figure 15 MOCO – OTCO relationship development timeline

4.1.2 Case #2

This case involves TACO the focal firm, who is a supplier to customers SICO, WTCO, MACO. TACO had been supplying to the onshore wind market four years before entering the offshore market looking for potential customers. In order to enter the offshore wind market TACO needed to diversify their product offerings.

The case involved multiple interviews with the following participants: 2-0-1: TACO Offshore wind operations director; 2-1-2: TACO Key account manager; 2-1-3: TACO Technical product manager; 2-1-4: TACO Political representative; 2-1-5: Council leader (business and trade) North Lincolnshire Council; 2-1-6: TACO Danish HQ representative; 2-1-7: UK steel market expert; 2-1-8: SICO Business development manager – UK OSW market. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

TACO's strategy in the offshore wind sector maintained rigorous effort and flexibility to deliver supply chain and product innovations for the major OEM turbine manufacturers. TACO faced many uncertainties in the steel sector a few years prior to and during the time of this research. When interviewing, Participant 2-0-1 recalled the 2008 floods in Australia that affected one of the world's largest iron ore suppliers causing iron ore prices to rocket, resulting in them charging TACO a premium and costing them dearly, having to pass on costs to their customers. TACO were vulnerable to numerous factors in the

market which would variate rapidly, requiring TACO to be able to respond quickly to recover from fluctuations in prices. The key factors affecting the costs and competitiveness of TACO summarized from the interviews undertaken were:

- Exchange rate fluctuations
- Transport costs
- Iron ore (Brazil, Australia) prices
- Coke and coal prices
- Scrap steel prices

The iron ore price had been reasonably stable when conducting interviews with participants at TACO; however, previously in 2008, the Australian floods meant that prices for iron ore jumped to £150-£200 per tonne. As a result, TACO faced great pressure on its costs which meant that it had to recover the losses in the market, passing them down onto their customers. Participant 2-0-1: “It was a painful exercise for everyone.” The experience from the floods led to a shift in the steel industry, with companies making themselves more resilient through being more self-sufficient in iron ore, coal and coke. However, companies such as TACO admitted that this was a challenge as, for example, the iron ore market was controlled by only three major players. This made the market very uncertain for TACO and exposed many risks. However, TACO owned an iron ore mine in India where a domestic only use policy was in place, which had changed to allow some supply to foreign markets reducing TACO’s market risk. Despite this TACO was still in a market characterized by high uncertainty and risk, Participant 2-0-1: “We are still exposed to the open market.”

The market TACO operated in shifted toward more short-term transactions due to the volatility of numerous factors in the market; no longer was it feasible to procure in large volumes, making order once or twice a year with their suppliers. The economic crisis in 2008 had a big effect on the steel market and resulted in changes to how companies in multiple tiers of the supply chain would procure products; the changes involved taking less risk. Participant 2-0-1 explained how before the crisis, most of the tower fabricators in the OSW sector would procure either quarterly, half yearly or annually to receive discounts and more favourable deals. TACO also procured from their suppliers in a similar fashion. Iron ore, coke and coal used to be procured on an annual basis; however, due to the volatility of prices and increased uncertainty in the market, iron ore prices were changing significantly every quarter, which presented a challenge for TACO to offer their

customers a fixed price for a period of time, and resulted in them taking on more risk in order to stay competitive.

TACO faced financial challenges in the steel plate market which was at over capacity due to the flood of foreign steel. The financial reward for TACO to take orders on steel plate were extremely low, and they could make much larger returns on other products; however, while receiving low returns, they were taking risks through taking on orders in the hope of winning long-term business. The financial reward was a barrier. The steel plate market which TACO operates in had a lot of capacity where their supply outweighed demand significantly; thus, during the time of this research, plate prices were low and TACO's margins diminished for their plate products compared to the other products they sold on the market. Participant 2-0-1: "It may be difficult to keep a sustained position in the sector; for example, if you look at the materials in a turbine and tower, they are quite a commoditized product, just structural steel." Participant 2-1-4 explained how there had been several prominent changes to procurement processes in the offshore wind supply chain around 2013/2014 where usually an OEM would free issue steel to the fabricators; however, it was now the fabricators who were responsible for the procurement process. Previously OEMs would procure steel, which could be problematic. Participant 2-0-1: "They wouldn't care where it would come from or how much it was. If there was something wrong with the steel, the OEMs would pass it back to the tower fabricators which in turn would deal with TACO or the steel supplier. The costs were passed down the supply chain and on to TACO."

TACO had to make closer relationships with the tower fabricators, where they spent a lot of time and investments doing so, due to the tower fabricators now procuring direct and reorganising their business to do so. Participant 2-1-3 was responsible for developing closer personal relationships with the relevant staff of the fabricators, to share information, plan, and re-align strategies with the tower fabricators to develop joint logistics initiatives that would enable future supplies to be delivered JIT. Participant 2-1-3: "Some of the big OEMs use e-bids for their procurement, but tower fabricators tend to procure more traditionally through previous relationships and experience with suppliers. They are all more cost-sensitive nowadays." TACO had four main competitors (Dilinger, Arcelor, DanSteel, Thyssenkrupp) all based in Europe, which gave TACO's customers many alternatives for choosing other suppliers, which meant TACO had to work extremely hard, not only to win the business but to ensure it was continuous, by maintaining high quality standards for their product, offering it at a competitive market

price, and offering complementary resources and knowledge to their potential partner. Participant 2-1-2: “I think it’s far more cost-sensitive now; it’s more about the bottom line, which is why some of these fancier tools such as e-bids are used, because they are able to get the lowest possible price for a contract. The use of e-bids removes the traditional, softer elements of relationships, and makes it a purely transactional relationship rather than a historical/traditional relationship.”

Participants 2-0-1 and 2-1-2 were new to working in the offshore wind industry and so came across many differences compared to the other sectors TACO had previously served. Relationships in the offshore wind industry were said to be different in terms of being less consistent and short-term orientated. Participant 2-1-2: “Historically, in relationships you would expect if you’re in a developed relationship, you may have a period where you drop out and in again; historically that may have been quite short. For example, Network rail - we have had a close relationship with them and you wouldn’t expect to come in and out as presumably they would want some consistency, whereas in the offshore supply chain it is different. There is quite a lot of choice, so depending on the circumstance you can be in or out; not to say the relationship is bad, but you can be in or out still.” Participant 2-0-1: “It’s important for a supplier to understand what type of relationship the customer wants. I think through time relationships are changing particularly because of market circumstances. I think relationships are different compared to what they used to be like; buyers are thinking differently compared to in the past.” Participant 2-1-2: “It depends on how many people you trust; the more people a customer trusts, the more choice they have.”

TACO’s aim was to sell volume on a monthly basis, with a strategy to grow their share in the wind sector (onshore and offshore) and to make sure they could provide consistent volume into the market. During the research period, TACO had high levels of demand in the onshore sector but wanted to supply to the offshore market as it was still nascent and growing. When TACO first entered the onshore wind industry, they were not considered specialists in any steel products relevant to wind turbine manufacture. Participant 2-1-2 explained: “We used to be called mill-based people, because we are here next to the mill, and the people in other offices see us as just being mill-based. Because historically we didn’t have a sector, we had products, so we used to be mill-based people; we would control what was sold off the plate mill and the people based in offices would tell us if they could go and sell or not ... whereas now, we work together with them. If they tell us

to stop selling plate in a certain sector and want a different product, I'm flexible, and not just stuck down to plate."

When supplying to the wind market TACO would be granted contracts or spot orders/projects from developers but then would need to research the market to identify which projects were about to start. TACO would then need to predict which company would be responsible for fabricating the towers, who would supply the towers and where the towers would be made, to forecast what their demand would look like, based on the relationships they had with players on every tier in the supply chain. Participant 2-1-2: "You get a feel for which projects are becoming hot and might drop, based on where they fit in the project pipeline." TACO established its wind tower hub in 2010 to process and distribute steel plate to wind turbine towers manufacturers. TACO had the capability to deliver up to 200,000 metric tons annually, enabling them to reduce customer processing time while ensuring full traceability. TACO offered several different products for the offshore wind sector. For jacket foundations, they supplied steel plate for piles, pile sleeves, circular hollow sections for j-tubes. They supplied steel plate for monopile solutions as well as speciality steels for gear manufacturing and bearing steels that would be used for the manufacture of bearings, supplied to a company mentioned in this study (SKCO) who in turn sold their bearings to wind turbine OEMs.

The product itself (steel plate) was a mature product, so TACO had to capture value through services that it would offer associated with the product. For example, TACO did this through offering delivery sequencing, profiling, and other initiatives aimed to save the customer's costs (discussed below). In 2010 TACO invested in what they called a 'wind tower hub' which provided their profiling and bevelling capability. It was developed not to be specific to one customer, but to build a strategy where TACO could offer more value to their products and improve their customer's operations in logistics and supply chain. This involved an investment by TACO of approximately £1m, for the facilities, land lease, and machinery, including two cutting machines and off-line bevelling equipment. Apart from supplying steel plate to fabricators for wind towers, TACO also wanted to enter the foundation solution market. This involved an investment of £2m in an 'offshore processing centre' that enabled TACO to provide steel solutions for foundations that included plate for pipe and other tubular products. The processing facility enabled TACO to flat pack and supply components to a fabricator, who would then be able fabricate the product much more quickly than when they previously received orders. The offshore processing centre also improved TACO's capabilities in making

tubular sections up to a certain size for offshore jackets, which were normally very large compared to other industries TACO had supplied in the past. To help improve their knowledge and performance in this new product offering, TACO signed a joint venture with a leading Germany steel manufacturer EKCO who had a reputation for supplying high-quality large tubular sections for offshore foundations. Investments in the offshore processing centre included welding equipment that enabled TACO to make tubular and hollow sections for jacket foundations.

When discussing the investments TACO made to overcome some of the challenges involved in entering the offshore wind industry, they pointed towards the further challenges faced, in the sense of the political situation that brought much uncertainty to investment by developers into the offshore wind market. They also realized that while they had developed the capabilities required by their customers, there were still parts of the supply chain that had not made similar investments and so were lacking, which had an impact on TACO. Political uncertainty was a major factor and barrier to relationship development in the offshore wind industry; for example, TACO's customers had customers who withdrew from making any solid commitments in the offshore wind industry. Southern Scottish Energy (SSE) is a good example as they backed out of a lot of projects they were going to invest in, due to political uncertainty from the government. TACO invested significant time and money in promoting themselves in the offshore wind sector; they were known for supplying to wide range of sectors, including onshore wind; however, they invested to increase awareness of their capabilities to supply to offshore wind projects. Participant 2-1-4 was hired by TACO in 2010; she played a political role at TACO ensuring that the message conveyed a push for UK content and created awareness of TACO as a player in the offshore wind industry. Over the course of four years, Participant 2-1-4 would attend quarterly board meetings with their customers, the wind turbine manufacturers. At most of these board meetings, TACO would also be introduced to their customer's customer, the developers, which enabled them to build relationships between key personnel of each organization. Participant 2-1-4: "We have made significant investments for the offshore wind sector. If someone asked us whether we could invest more, right now we are in difficult conditions; offshore hasn't taken place as quick as we had hoped, and there is still a lot of traction required in the UK. There is no fabricator in the UK despite SICO making investment decisions. That's good, but we still need someone who is going to need steel; it is a barrier at the moment."

During the research period, as the offshore wind industry was still in its nascent stages, various solutions and designs were being put forward by potential suppliers; all of the designs offered in the market were in their prototype stage, leading to a lot of speculation and uncertainty in the market as to what solutions would be required for each project. The location and conditions varied among the upcoming green light projects. Participant 2-1-4: “It is a green project in its early stages, and we are waiting for some of the projects to break. However, we are actively engaged to try and support and help the development of a foundation solution with our clients.”

This study also involved interviews with the Participant 2-1-5, council leader for North Lincolnshire Council (NLC) who was responsible for business and trade. An interview took place with the business and trade director of NLC, in which it was stressed that the council wanted to know more about the opportunities offshore wind could bring to the local economy. This involved working with TACO to identify the number of jobs that could be created in the area and the type of jobs that would be needed in the supply chain. It was stated that a great sum of investment was needed in infrastructure for the region to be able to provide a solid supply chain in offshore wind: the investment required would be approximately £160 million. NLC would also provide support towards TACO’s bids to customers that helped strengthen TACO’s case to win orders. The interview further pointed out that the industry was going through an uncertain period, with one of the main challenges being that there was no supply chain in place to serve a potential offshore wind farm. It was important for both TACO and NLC to work together to build a local supply chain to meet likely government requirements for local sourcing.

The way TACO transacted with each customer was quite different; for example, for their customers based in Germany, TACO transacted and communicated with them through a distribution arm of TACO, which was an agent (TABB) based in Germany. Participant 2-1-2 would transact with the TABB in Germany who would in turn transact with TACO’s German customers. TABB would visit TACO’s customers in Germany more regularly than Participant 2-1-2, but Participant 2-1-2 would join him on most visits to provide support and build closer bonds with the customer. It was important for TACO to use TABB, as he was based within close proximity to their customer and was always on call to provide support and answer any queries. Further, it was important to use TABB, due to similarities in language and cultural perspectives. For customers in the UK, Participant 2-1-2 would take a direct lead, whilst in other regions of Europe TACO would use offices with locally based representatives. Participant 2-0-1: “Culturally, we use a

local contact which is probably quite different to other suppliers.” TACO would undertake a lot of work on account development plans, and improving internal processes such as how they evaluated what they forecast to sell to customers and how they developed those customer relationships accordingly. This involved using a customer relationship management tool called ‘focus’. TACO developed account development plans for all their key customers, including SWOT analysis and various other performance measurement indicators. TACO performed regular updates and reviews of their customer account development plans, to make sure that they were spending their time and efforts in the right areas but also on the right customers. Participant 2-1-2: “It’s quite a robust process.”

TACO also conducted annual general customer satisfaction surveys that would be undertaken with all of their customers. The survey comprised a call by a research company who would interview the customer and ask for their feedback on TACO’s performance as well as their contribution to the relationship. Participant 2-1-2: “This allows us to set our objectives in line with the feedback so we know where to focus our energy and break that down into.” A survey from the previous year illustrated one main point that was raised on the commercial side of the business: TACO’s enquiry response times with customers. Highlighted was the fact that it was vitally important that, when receiving an enquiry, TACO would need provide an answer a lot more quickly than they had previously done, to win more jobs from existing customers as well as new ones. When TACO received an order from a customer, they had a pre-production meeting to sit down, plan, and get some acceptance from the customer that they were happy with how they would proceed with the order, what information would be shared between the partners, and how the partners would share all the documentation involved; for example, using electronic methods of sending documents such as test certificates. TACO would sit down and record all the staff members of the customer who would require specific documentation from various staff levels at TACO: supply chain managers, engineers, logistics managers, and production staff. The customer’s staff would then be set up on TACO’s system, so when the relevant documents were produced, they were automatically sent to the person the customer required; this would be the same for invoices and dispatch notes. Participant 2-1-2: “The documentation goes to the right people in the company to make the customers life easier.”

TACO also built up a service level agreement (SLA) which was outside of the terms and conditions and legal contracts associated with each of their customer relationships. The

SLA was set up to approach the customer from a more personal angle and ensure that not only the transactional or technical elements of the relationship were evaluated. Participant 2-0-1: “It’s more of the softer elements of the relationship; for example, if a customer sends us an enquiry, the SLA will let them know what TACO expect from the enquiry in order to quote it properly. For instance, the sizes, grades, tolerances. We have found that in the past it has been a back and forth process, as some enquiries lack the information we need, so setting an SLA formally saves a lot of time and gives the expectations of both sides.” Other parts of the SLA included frequency of meetings, where TACO would have a working document in place, which helped TACO tighten and engage more in the relationships they had with customers. Figure 16 below illustrates major events taking place in the OSW and steel industries, directly effecting TACO.

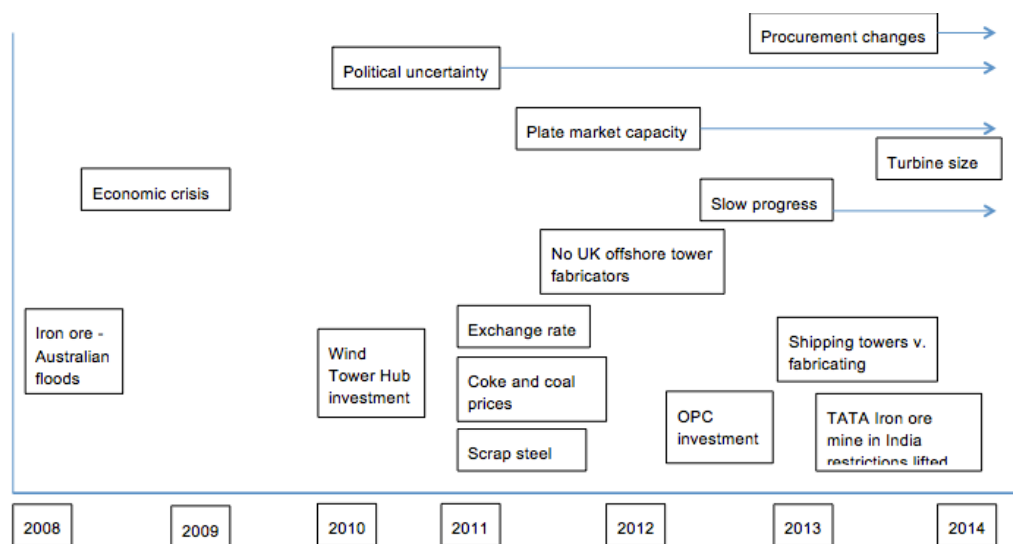


Figure 16 Background of events - TACO

4.1.2.1 Case #2.1

For this case TACO was the focal firm and supplier, while SICO was the customer. Participants involved in the case included: 2-0-1: TACO Offshore wind operations director; 2-1-2: TACO Key account manager; 2-1-3: TACO Technical product manager; 2-1-4: TACO Political representative; 2-1-6: TACO Danish HQ representative and 2-1-8: SICO Business development manager – UK OSW market. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

SICO is a German owned subsidiary, wind turbine manufacturer established in 1980 in Denmark. In 2011 SICO employed 7,800 staff, had 6.3% share of the world wind turbine

market and established their offshore wind headquarters in Hamburg, Germany. In 2015 SICO had a combined market share of 63% of European offshore wind turbines.

Awareness stage

TACO was aware that to enter the offshore market and be selected by SICO to become a strategic supplier, their production and manufacturing capabilities had to meet stringent quality standards. It was also key that TACO could develop their logistics capabilities to deliver to the requirements of offshore wind construction projects, which would often require JIT delivery as well as sequence deliveries of specific parts. TACO could improve their quality standards as well as logistics capabilities by developing a good relationship with SICO and building their trust to start joint initiatives. SICO's complementary knowledge would help TACO develop their own capabilities so they could provide a solid product and potentially win orders from other turbine OEMS in the market.

TACO first met SICO at an offshore wind exhibition in 2009 where TACO's sales manager and commercial manager met SICO's procurement staff and UK director. From their first meeting in 2009 until early 2011, there were no transactions between the two companies. TACO had staff based in Copenhagen, referred to in this study as Participant 2-1-6, who was made responsible for developing the relationship with SICO's staff at their Danish HQ. This would involve monthly visits to SICO's HQ in Brande to discuss TACO's investments in the offshore wind industry and their new capabilities and product offerings to the market as well as future project pipelines. TACO had not undertaken a project in the offshore wind industry at the time of meeting SICO and deemed SICO a feasible partner and key to their entrance to the market. TACO was aware of SICO's strong reputation and experience in offshore wind, with SICO holding a monopoly in the turbine OEM market. TACO did have some transactions with SICO previously, but these were for products not related to the offshore wind industry and involved staff in other areas of TACO's and SICO's organizations.

Exploration stage

Monthly visits with updates of TACO's operations began which included visits from TACO's UK staff, including Participant 2-1-2, 2-1-3 and 2-1-4 as well as production, technical and engineering staff; thus, the relationship between the two companies spanned multiple levels not only in the UK but also throughout TACO's offices and agents in Europe. The regular meetings involving numerous staff allowed the two companies to build social bonds, develop common ground, and identify common goals between the two

organizations and personnel. There would be clear expectations set out regarding the type of information shared between the companies; for example, general market information, market demand, and project pipelines, as well as financial information and views on the steel plate market. Other expectations were set out such as the frequency of communication, the time for responding to SICO's enquiries, and future potential joint initiatives the two companies could work on.

Both organizations were taking part in two-way information exchange where SICO would provide TACO with an idea of their future pipeline and projects they were looking to secure, whilst TACO provided SICO with sensitive financial data that enabled SICO to calculate exact costs and include them in their bid to developers. This showed SICO that TACO trusted them and was willing to share whatever data necessary to strengthen the relationship and win an order from SICO. TACO offered a mature product to SICO, whilst SICO was a major manufacturer of technical process equipment for manufacturing industries and so offered complementary products to TACO, as TACO would purchase SICO's new systems and process technologies to use in their steel mills. SICO had a choice of many steel suppliers apart from TACO: in the UK, they had a choice between TACO and another major steel producer. In Europe, there was a large selection of suppliers from Germany, Turkey, Poland and Sweden; some known for their quality whilst others known for their low cost. Then further away, there were suppliers in China, who could offer steel at very low rates compared to the rest of Europe and the UK.

Despite facing tough competition from high-quality experienced suppliers as well as low cost suppliers, TACO could offer advantages to SICO that suppliers outside of the UK could not. TACO's competitors would transport their steel to SICO by sea, which would take days and could involve port delays leading to higher costs and risks, which were especially important when considering offshore wind construction. Due to TACO's close proximity to the offshore wind development sites, TACO could transport their steel by rail to SICO's potential waterside facility within 20 minutes. Their competitors would not be able to achieve the same efficiency unless they invested significantly in facilities in the UK. During the construction stage of the wind turbine, TACO could provide an agile logistics strategy that would be low risk, low cost and efficient. There would be a very rare chance of delays, and production could be planned to achieve high cost savings. Compatibility between the partners from being in such close proximity to one another would ensure a close working relationship and higher chances of trust being built; therefore, SICO saw TACO as a feasible partner.

Expansion stage

Towards the end of 2011, TACO secured an order for 25,000 tonnes of high-quality profiled steel plate that would be used to build 150 onshore wind towers from SICO. The contract would run until January 2013 and was the largest to date for TACO's dedicated wind tower hub. The deal was worth an eight-figure-pound sum and established TACO strategic customer alliance with SICO. Participant 2-1-4: "This major contract, and our position as SICO's nominated sub-contractor, is a direct result of the investment in our [TACO] wind tower hub and a great deal of work from the TACO team,"

Being part of a strategic customer alliance with SICO helped TACO become a step closer to their main objective, which was to be SICO's key supplier in the offshore wind market. The final shipment of the 25,000t order was delivered in January 2013 and the fulfilment of this order was perceived to be executed well by TACO. However, shortly after the final delivery, TACO's key account manager left the department and was replaced by Participant 2-1-2. Shortly after fulfilling SICO's order, TACO ran an initiative to improve the steel plate surface quality of their steel. The steel they had been supplying to SICO was delivered to SICO's nominated fabricators who were not entirely happy with the quality of TACO's steel. The fabricators found that when they received the steel, there were significant proportions of rework needing to be undertaken, which added on time and costs to the fabricators' operations. Participant 2-0-1 admitted that there would always be some rework required and usually expected from TACO's customers.

TACO wanted to make sure the quality was improved to meet EURONORM standards, thereby improving the fabricators' processing times and ultimately reducing the costs of their customer, SICO. Not only would the quality initiative improve the processing time of the fabricators, but it was also put in place to improve TACO's logistics capabilities; Participant 2-1-2: "It is massively going to help us remove time and cost out of the supply chain." To start the quality initiative, TACO staff including the mill production staff, technical managers, and product managers visited SICO with the key account managers to explain the benefits of working together with SICO on the initiative. They wanted SICO to be involved and to invest in the initiative so the two companies would come closer and develop common goals; also, for TACO to gain knowledge from SICO on how the quality initiative could be started and would work. After several visits by staff from both organizations, a joint project between TACO's mills in Northern England and Scotland and SICO was agreed.

The joint quality initiative required heavy investment by TACO in terms of time, dedicating personnel and capital investment in their mills. The initiative involved visits to TACO's mills by specialists at SICO to split up the processes involved when rolling steel plate in the mill and to identify surface quality issues. It also involved large project teams, with members from shop floor to senior levels of TACO's organization. An outcome of the programme was that it developed stringent routines on cleaning equipment after a certain amount of rolling and recording it. Previously staff would not have known whether the equipment had been cleaned adequately or not. Another outcome resulted in a deep clean of TACO's mills as previously equipment in the mill rattled and surface debris would fall on to the plate surface, reducing the quality of the finish. Participant 2-1-3: "Improving the surface quality allows for less rework, less start and stop during the process, less welding repairs on tower sections... If you get far down the process, and it's only on paint application that you notice the issue in a particular section of the tower, then you will have to take that section out of the process; it adds a lot more time onto the process and affects their ability to complete a project on time."

TACO immediately saw the benefits of starting the initiative with SICO, as its manufacturing capabilities were instantly improved. The initiative also solved issues faced by TACO previously that were associated with the identification of plates. Usually once manufactured, TACO would store the plates in its warehouse facility; however, the problem was that it was hard to locate the plates once an order had been received, as they were usually not marked or easily identifiable. As a result of the quality initiative, TACO would stamp and mark each plate that was produced which led to them never having issues finding the right plate when it was needed. Even with SLAs and expectations set out at the beginning of the relationship, there were issues with the frequency and timeliness of information sharing from SICO. While TACO would provide on-time, on-demand information to SICO whenever they required, the same was not delivered by SICO to TACO's staff when they enquired for specific data on future pipelines and orders.

There was a slight issue with trust emerging, as well as uncertainty in the relationship. Information sharing from SICO to TACO began two-way, but after the order was fulfilled communication started to become one way from TACO's side only, which made it hard for the staff to build trust in the relationship. TACO wanted to know SICO's future plans and potential projects they would be getting involved in, so they could plan ahead and minimize their production costs; however, SICO provided information that was often delayed which ramped up the costs for TACO, as they would receive a potential order

from SICO and have limited time to plan production and fulfil the order effectively. Participant 2-0-1: “SICO will secure capacity and have a good idea of demand, but they will wait until projects drop and at that point will load a steel supplier with order. The projects can vary, so whether they are in the UK or overseas will depend on where you free issue the steel to (that was the case during that time).” Despite the one-way communication from SICO, and a slight concern about mutual trust from TACO, the level of contact between TACO and SICO continued at a reasonable level, with regular telephone calls, and face-to-face meetings at trade shows.

Dissolution stage

After delivering the order for 25,000t to SICO, TACO did not receive another order they were hoping for as SICO had not received an order from their customer, the developers, due to uncertainty around contracts for difference and electricity market reforms. Despite the ongoing investment in their relationship with SICO and no potential orders in the near future, TACO saw it important to maintain the relationship with SICO so they were in place to supply SICO when the next offshore wind project would break. A year later SICO contacted TACO, as they were looking to place another large order of steel plate for a contract they had won from a developer of a major offshore wind site that had been given the green light.

TACO was aware that some OEMs would give steel plate procurement responsibility to their suppliers, and would use various procurement methods such as e-bids to decide on the supplier, but could also use a list of preferred suppliers that were on the tower fabricators’ procurement lists. In some cases, the tower fabricators would then procure their own steel, due to their experience in procuring and relationships with steel mills. Participant 2-1-3: “The procurement process depended on who the work was for and where the work was going.” In SICO’s case, steel procurement responsibility was given to the tower fabricators and so it was essential for TACO to have good working relationships with the OEMs and the tower fabricators. TACO had long-running relationships with almost all of the tower fabricators in the market; Participant 2-1-2 particularly knew the procurement staff on a personal level and this brought high levels of compatibility in the relationship with SICO and its supply chain. As a result, TACO believed they had a strong case for working with SICO, compared to their competitors. However, unlike before when SICO purchased from TACO based on their relationship, SICO decided to put the tender to the market via a Dutch auction that was open to

suppliers throughout Europe. The new procurement strategy adopted by SICO was structured and transparent and used e-bids. Participant 2-0-1: “It was not the traditional method of procurement where a supplier can transact and negotiate with the customer.” TACO had used e-bids in the past, in particular, e-bids both in supplying material but also when procuring it, which is what they were expecting in the offshore wind industry.

TACO participated in the bid along with numerous other European competitors, but was unsuccessful from a price perspective. When asked to comment on what relationship stage TACO was currently in with SICO, Participant 2-1-2 explained: “We have experienced moving through the expansion stage with SICO but then tracking back” We find that, despite having a mature relationship, for example with SICO. The fact that we got a big contract in 2012 and delivered it, despite having a strong relationship, you can find that you may not supply again for several years; that’s the way they work. Participant 2-0-1 commented further: “You may have a long-term relationship with a customer but that does not mean that the transactions are long-term.”

In March 2014, SICO invested £310m in turbine blade manufacturing facilities in Hull for their intended new 6MW turbine model. TACO had previously strengthened their capabilities with the help of SICO and were now capable of producing most of the size specifications required in the offshore market, yet SICO’s 6MW model required a size TACO was not capable of producing. TACO was faced with a decision on whether to invest in capital equipment for a larger slab caster or buy the slab from elsewhere and roll it through their mill that was capable of rolling the larger slab sizes. Participant 2-0-1: “It is a case of chicken or the egg; this is due to the fact there is no tower fabricator in the UK that requires the larger slab size at the moment, so there is no obvious firm commitment; however, larger slab sizes will be required in the future.” Participant 2-1-2 commented further about the uncertainty TACO faced: “We are aware of the investment decision made by SICO in Hull, to make the 6MW turbine. We know that at some point there will be an overseas offshore tower fabricator wanting to come into the UK to make offshore towers. There are rumours of who that might be but we don’t know; we just need to make sure that we are in the right position to support the demand for offshore steel.”

The relationship died out because the two companies were not able to re-ignite the relationship during a period of one year with no transactions. Participant 2-1-3: “It’s a fine line for both the buyer and supplier; if you’re not too careful, you can revert back to the very early stages of the relationship and you forget what each other offers and requires

in the relationship.” Another factor that prevented the companies from moving to expansion stage was SICO’s sole focus to purchase based on cost in their second tender. The two companies had worked previously and built trust and common working procedures together. There was a history of personal relationships and compatibility between the two organizations; nevertheless, SICO did not respond mutually and consider alternative suppliers, as most likely they were unhappy with the quality despite TACO’s investments to deliver to SICO’s standards. The same mistake made again on delivering the product to correct standards proved to speed up relationship dissolution (Chen et al., 2019). Participant 2-0-1: “You want a relationship as consistent as possible; it’s how you keep injecting life into that relationship and making sure you maintain a high level of contact and discussions. If a customer was busy procuring a contract from another supplier, then naturally they would spend more time on that than with a supplier that wasn’t supplying.” Figure 17 below illustrates TACO and SICO’s relationship development timeline.

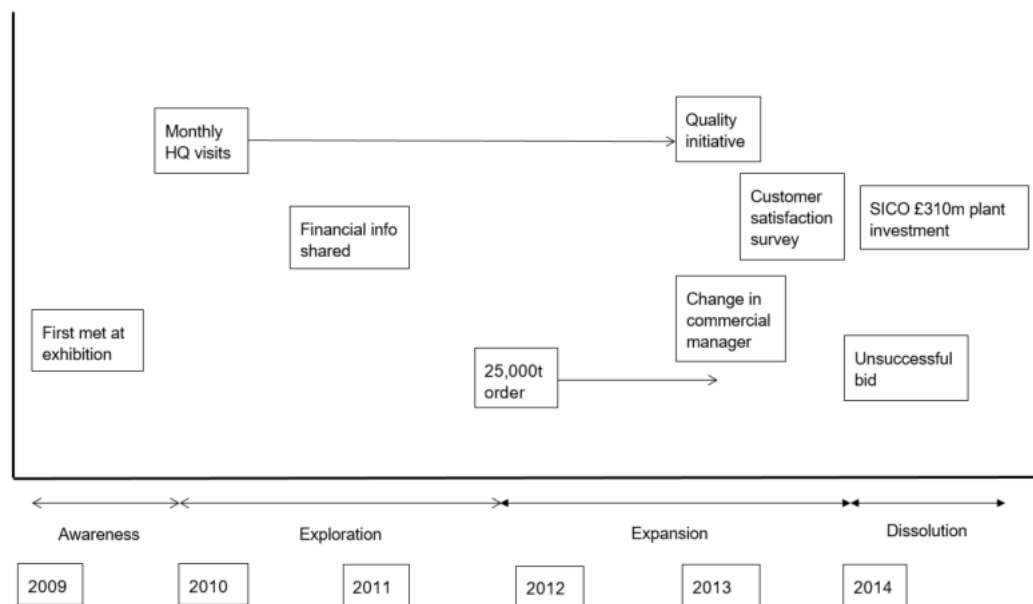


Figure 17 TACO and SICO relationship development timeline

4.1.2.2 Case #2.2

This case involves TACO as the focal firm and supplier, WTCO is the customer. The case is informed through multiple interviews with the following participants: 2-0-1: TACO Offshore wind operations director and 2-1-2: TACO Key account manager. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

WTCO was first established in 2011 with an 80% investment from Southern Scottish Energy (SSE) and a 20% investment from Highlands and Islands Enterprise. It is a specialist supplier of wind turbine towers to markets across Europe and the only offshore turbine tower manufacturer based in the UK. WTCO has an 18.25-hectare site based in Argyll, Scotland and currently employs 130 people. They supply turbine towers for several wind turbine manufacturers involved in this study such as SICO and other major wind turbine OEMs based in Europe. Other customers of WTCO include energy companies' SSE and Scottish Power. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

Awareness stage

The relationship between TACO and WTCO first began in 2002 when WTCO was formerly owned by a major European OEM wind turbine manufacturer. In 2006 Vestas sold facility to Skycon, (been through various ownerships). TACO and WTCO started transacting in 2008 when TACO supplied OEMs who would then contract WTCO to do the fabrication. In effect, WTCO were being supplied by TACO but there were no transactions between the two companies. The OEMs would transact with TACO for the steel and then use WTCO to fabricate the towers, and then sell to a developer (e.g. SSE).

The companies first met in March 2013 at All Energy wind conference in Aberdeen where TACO's sales representative met procurement staff from WTCO; this brought about a more direct conversation between the two companies and started their relationship. WTCO were new to the offshore industry; as a result, their offshore wind tower solutions were designed from scratch and had varying design specifications. TACO's priority at this stage was to invest much of their time and knowledge into developing WTCO's capabilities and complementary resources to gain their trust. Participant 2-1-2: I have engaged a guy in what's called 'customer technical services' (WTCO), who is an advisory engineer, and I have said, if you need any more in-depth technical knowledge, we have the resources at TACO to help you." From March 2013 to June 2013, TACO's sales reps and WTCO procurement team began discussions on future projects; this led to a small order being placed by WTCO for replacement steel in July 2013. Previously WTCO would be free issued steel by the OEMs, but now they would be responsible for the procurement process. A pre-production meeting was arranged where staff from both companies met to discuss capabilities and solutions.

Exploration stage

At this stage WTCO were new to the process of steel procurement; previously, when being free issued steel, Participant 2-1-2: “WTCO would not pay particular attention to the type of steel procured, i.e. grade, size, solutions.” Once responsible for the procurement process, TACO sales representatives worked with WTCO’s procurement team to explain procurement processes to them and help them understand more about the product they would be buying. This involved several HQ visits by staff on both sides and technical knowledge exchange between individuals in both organizations. Participant 2-1-2 listened to the tower fabricators’ engineering and production staff to make changes to the quality and profiling of their steel, to improve fabrication speed at the fabricators.

After the order was delivered in August 2013, staff at TACO suggested a supplier open day where staff from WTCO would visit TACO’s steel mill to get a better idea of the processes and value-added services TACO offer. A customer satisfaction survey was sent to WTCO shortly after receiving the delivery of their small order and in August, staff from both companies worked together on gathering feedback on the quality of the product they received. Discussions regarding future pipelines also took place to give TACO a better idea of WTCO’s order book and to work out what proportion of orders would be from different customers; for example, developers or OEMs. This gave TACO a better idea of which relationships to focus and spend more energy on. The customer satisfaction survey yielded good feedback; however, two areas for improvement were suggested by WTCO. One was the quality of the product, as WTCO would receive steel plate with surface quality issues and the other was unsatisfactory delivery performance. Following the feedback and suggested areas for improvement, the sales representative at TACO organized a visit to WTCO HQ, but this time bringing TACO’s commercial manager and mill plant manager. The visit was used to talk about the TACO investment in the quality initiative they were undertaking and to show WTCO that they were actively trying to improve their product quality and position themselves for once a project would break.

Order book information sharing was in August 2013; Participant 2-1-2: “We discuss future pipelines in order to get a better idea of WTCO’s order book, to work out what proportion of WTCO order book are from different customers (developers, OEMs). This was done so we would know which relationships were best to focus our energy on. To be honest, it is a combination; we have around 25/30 different people we are maintaining contact with.” TACO’s mill plant manager gave presentations to the commercial

managers of WTCO; the plant manager also inspected WTCO's facilities to understand why it was so critical to get the surface quality of the product right. He then brought the message back to TACO. Participant 2-1-2: "Bringing the mill manager with me to when meeting with WTCO worked really well and strengthened our relationship." WTCO attended a conference where TACO lent their tower turbine model used at previous conferences to put on display. This was also accompanied by publicity material that would promote the current relationship between WTCO and TACO.

TACO introduced a service level agreement (SLA) for their relationship with WTCO, which was outside of terms and conditions and legal formalities and focused more on the softer elements of the relationship. For example, if a customer sent TACO an enquiry, the SLA would let them know what TACO expected from the enquiry to quote it properly, e.g. the sizes, grades, tolerances. Participant 2-0-1: "We have found that in the past it has been a back and forth process, as some enquiries lack the information we need, so setting an SLA formally saves a lot of time and gives the expectations of both sides. Other parts of the SLA included a working document detailing the frequency of meetings, which helped strengthen their relationships with WTCO. The SLA helped evaluate each partner's performance and capabilities they brought to the relationship, which reduced some uncertainty and made it easier to test goal compatibility between the two partners.

Expansion stage

Both organizations had a good idea of what the other could bring to the relationship; they both found common ground in their goals and working relationships. Both showed goodwill to each other where information shared was a two-way process and there was mutual trust in each other. Moreover, TACO showed WTCO that they were willing to take risks and invest in their relationship to satisfy WTCO. Whilst WTCO had experienced some quality issues with TACO's previous deliveries, they were convinced that TACO would do everything possible to ensure these quality issues were solved if they were to win another order. The exchange of information between the two partners intensified: TACO offered support to WTCO by providing market knowledge and sourcing strategies with WTCO and shared highly sensitive information with WTCO, to reduce uncertainties WTCO faced being a new to the steel industry. This helped reduce WTCO's risk and gave them a clearer idea about TACO's intentions for their future cooperation.

Consequently, through multiple staff visits, two-way technical knowledge exchange and SLAs in place, in December 2013 TACO received a second order from WTCO that was larger than the first. A month later another order was placed that would run until summer 2014; Participant 2-0-1: “It is now starting to get more consistent.” A technical visit to WTCO by one of TACO’s specialist welding staff was proposed but had not yet taken place. The welding engineer was part of TACO’s research and development centre and focused on improvements in welding processes taken from experience in ship building. The welding staff member formed a partnership with a welding equipment supplier so they could go into WTCO and offer the technology to weld, as well as the best method to weld efficiently. The visit would involve suggesting ways in which WTCO could improve their welding process and shorten their welding times. Due to TACO’s strong experience in the steel industry, it was clear that they could offer many complementary competences to WTCO, and could improve their competences in manufacturing if they decided to work with TACO in the long-run.

The development of the partnership faced challenges due to the Scottish political situation, which created a lot of uncertainty as WTCO’s customer was a Scottish government enterprise. TACO wanted to assure WTCO that it would do everything possible to support WTCO in the other areas under their control, to develop a long-term agreement. Participant 2-1-2: “WTCO is an interesting company, as they are proposing to go into offshore as opposed to a foreign tower fabricator coming into the UK. They are trying to put a case together to the Scottish government, but it is all very political due to the referendum on independence. It is very political as WTCO is 80% owned by SSE and 20% owned by Highlands and Islands (a Scottish Government enterprise).”

Despite high political uncertainties affecting the market, the two companies continued to communicate and meet to discuss ways to improve efficiency in their manufacturing operations. There was a silver lining to the political cloud as it was suggested many of the proposed Scottish wind farms would require local content, with WTCO likely to be chosen as a supplier of local content. Consequently, TACO raised the importance of keeping their relationship with WTCO engaged and on-going, keeping up the discussion so as not to revert to earlier stages. It was vital to TACO that WTCO were satisfied and to select them as a key strategic supplier; therefore, TACO invested all their efforts in providing support to WTCO, through technical knowledge and market exchange, updating and improving their existing joint initiatives, as well as discussing ideas for future initiatives together. WTCO recognized that TACO was bringing a lot to the table;

they also felt a close bond between the organizations that was a result of working closely together over two years, delivering and working on orders, and evaluating and improving each other's performance and capabilities. Each partner was satisfied with the other's performance and what they could bring to the relationship. There was a mutual understanding that, once the political situation had blown over, the orders would start to flow in and both parties were ready to work together for future orders. Figure 18 below illustrates the relationship development timeline for TACO and WTCO.

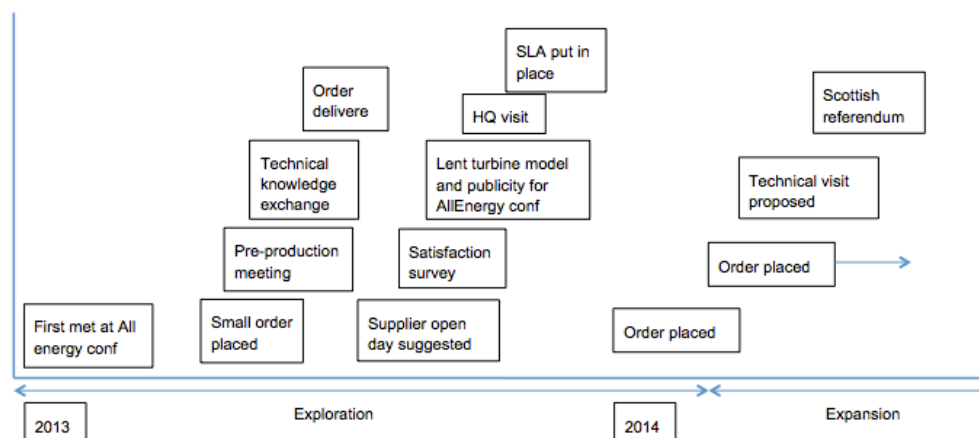


Figure 18 TACO and WTCO relationship development timeline

4.1.2.3 Case #2.3

This case examines TACO as the focal firm who is a supplier to MACO, the customer. The case involved numerous interviews, over a period of two years with the following participants: 2-1-2: TACO Key account manager; 2-1-3: TACO Technical product manager and 2-1-4: TACO Political representative. Further details on the participants interviewed for this case can be found in the data collection schedule in Appendix 6.

The relationship between TACO and MACO spans over 50 years. MACO is a British family- owned company and was founded in 1923. MACO employs over 1,000 people in 140 countries and has an annualized turnover of £100 million. The company specializes in supplying fabricated steel bridging, structural steelwork and associated services internationally. Participants interviewed for this case can be found in Appendix 6.

Awareness stage

Social bonds between TACO's sales team and MACO's procurement team grew stronger. From a customer's perspective, TACO would talk to MACO's procurement team on a day-to-day basis. Furthermore, on a higher level, communication between commercial

managers of both organisations would take place once a week. The TACO political representative would be in regular contact with MACO's PR and marketing team to develop joint press releases. Key account manager, Participant 2-1-3: "We are well engaged throughout the whole of their organization." Previously, the relationship with MACO was with Britain's largest steel company, which was acquired by TACO. Before supplying towers to MACO, the relationship involved supplying steel for MACO's bridge business. In 2008, a new opportunity arose for MACO to enter the UK wind market. This required MACO to search for suppliers to procure steel, to manufacture turbine towers for upcoming onshore wind projects. However, MACO did not have future plans to enter the offshore wind sector; Participant 2-1-2: "I see MACO's position being more stable in the onshore sector, but they do not have ambitions to enter the offshore wind sector."

Exploration stage

In 2010, MACO began working with TACO on onshore turbine towers. At this point, MACO were new to the onshore tower industry whilst TACO already had 10 years' experience. From the start of the relationship, TACO and MACO conducted quarterly commercial and technical visits to each other's headquarters, something they had been doing for years previously when working on projects in other industries. Commercial visits involved sharing information regarding market demand and potential upcoming projects MACO would be involved in or bidding for, as well as cost structures and pricing information from both partners. The ongoing meetings on how to develop the supply chain enabled both companies to build common ground and build compatible working practices on top of the informal structures and personal relationships that had already existed.

In early 2011 MACO invested £38 million in a facility in Newhouse, UK, specifically for the manufacture of wind turbine towers and other tubular products. After the investment, numerous technical visits were made to each company's HQ by both sides of production staff, to share technical information and improve MACO's knowledge on the process of profiling plate. Other technical visits involved MACO graduates visiting TACO's mill to get more in-depth knowledge of the products being supplied to MACO. Whilst working with MACO for over four years on towers, TACO have been able to tailor their service to MACO's requirements. Despite TACO's product being commoditized and in its mature stage, TACO have been able to create value through up-selling their services to MACO, as well as creating joint initiatives to identify solutions to cut cost together. Partly

due to the previous ties between MACO and TACO's previous owners, there was a high level of mutual trust built up over the many years both companies had worked together. Both companies shared a high level of trust which continued with TACO and led to mutual information sharing and knowledge exchange. The personal relationships between personnel of both companies grew stronger. Participant 2-1-2 commented on TACO's relationship with MACO: "It is a fairly open relationship in terms of project pipeline: they keep us informed about what projects are breaking."

Expansion stage

An opportunity to strengthen the relationship arose in 2013. After several technical visits by TACO production staff explaining the benefits of a tailor-made approach to their services, MACO suggested the two partners start what was known as the sequence production initiative. Previously, MACO would order steel in quantity from TACO and, once received, store it in bulk at their facility, which would then need to be managed for sequenced production of towers. The sequence production initiative involved TACO tailoring its pricing structures to maximize the value of their services. One immediate benefit this would achieve would be the shortening lead times, through TACO reserving their rolling plan, giving MACO up to the last minute to place an order on a project. This enabled MACO to hold less stock as they wouldn't need to order in bulk quantity, store the product outside, and then manage the product sequence once ready to be processed. Instead, the steel plate could be delivered to MACO via in-can sequence or section sequence. This improved MACO's cash-flow immediately as they would hold less stock; it also improved production efficiency as well as reducing lead-times of MACO's operations. Key account manager 2-1-2: "It works very well."

Commitment stage

The relationship between TACO and MACO was at a mature stage due to both parties fully understanding each other's requirements and offerings, as well as capabilities. There was a strong bond and feeling of mutual trust, where the relationship was said to be 'very supportive' and 'two-way'. Participant 2-1-4 commented on the relationship with MACO: "We can describe our relationship with some customers as mature as we know how they transact, what they require, and what we can offer, but every time a longer-term project breaks we find ourselves returning to the early stages. But there is an underlying relationship and maturity in everything we have done in the past." Figure 19 below illustrates the relationship development timeline of TACO and MACO.

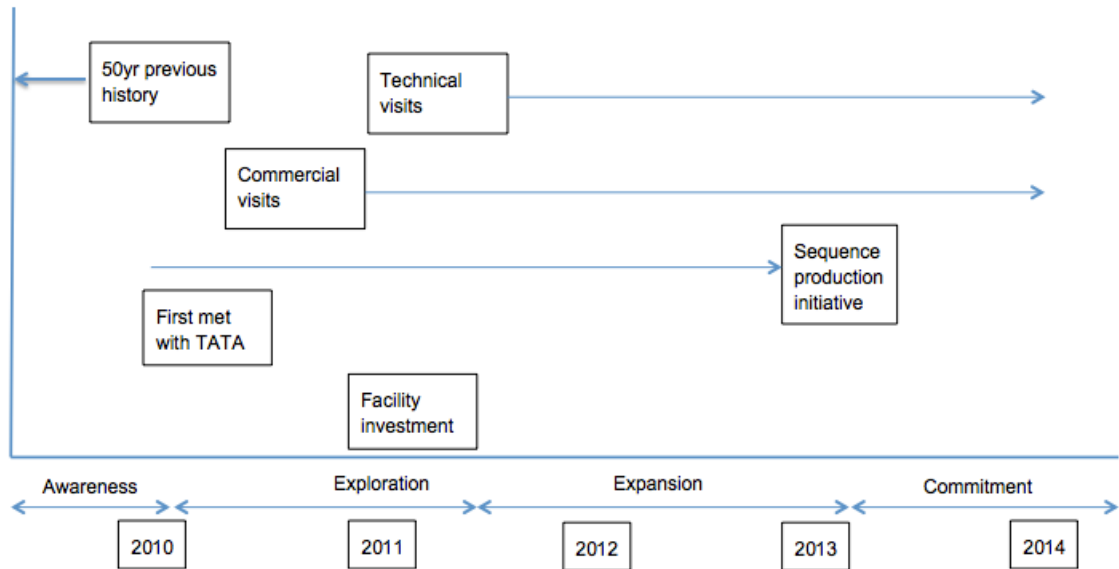


Figure 19 - TACO – MACO relationship development timeline

4.1.3 Case #3

This case analysis the relationships between BRCO, the focal firm and a number of its customers, these include: GRCO, STRCO, SKANCO and BAMCO. The following participants were involved in this case study; 3-0-1: BRCO OSW operations director; 3-1-2: BRCO Key account manager; 3-1-3: BRCO Technical product manager; 3-1-4: Concrete centre director; 3-1-5: ABCO Business development manager; 3-1-6: ABCO Director; 3-1-7: Consultant – OSW consultant. Further details about the interviews can be found in Appendix 6.

BRCO was founded in 1908 and specializes in the design and development of bar reinforcement and welded wire mesh. BRCO is the largest manufacturer of steel reinforcement and associated products in the UK. BRCO operate a steel mill in Wales and several regional depots around the UK. The reinforced steel manufacturer owns 60% of the UK's rebar market and source 95% of their steel from the UK scrap metal market. One of BRCO's main selling points is the visibility of their supply chain. Their scrap metal is collected in the UK, taken to their factory to be milled, delivered to their regional facilities, and transported to fabricators. BRCO offer 100% UK content and have very low carbon emissions in their manufacturing process. BRCO also have a BES 6001 certification for the responsible sourcing of construction products. They pride themselves on their supply chain on being sustainable, responsible, and safe. To offer a new product for the OSW sector, BRCO have recently certified a new product named Ellipse. This enables radius bending of rebar that improves production volume and time significantly.

BRCO introduced sustainability benefits to the supply chain through the local sourcing of raw materials (scrap metal usually from cars) where all scrap is from the UK and from within an average 200-mile radius. BRCO aims to increase the sustainability of its supply chain through delivering rebar by rail from its main facilities in Wales to BRCO fabrication units, cutting CO₂ emissions from road transportation. BRCO is also considering delivering stock bar by sea for specific projects, some of the Round 3 UK OSW farm projects. The supply chain sustainability benefits are highlighted through having a number of fabrication yards geographically spread across the UK, with low delivery distances (typically 75 miles) allowing BRCO to concentrate on local projects. Participant 3-1-2: “We have a good story, 98% recycled content, 2% lost in slag that is skimmed off the top that is sold on for road coverings ... All scrap is UK sourced ... We would only buy scrap from outside the UK if there is a major shortage or crisis; last time we bought scrap outside the UK was five years ago.”

Through numerous interviews with BRCO, key capabilities and competences were highlighted including various benefits and cost savings in the supply chain have been identified:

- Using higher grade steel can result in less overall steel being used in the foundation.
- Unlike many of its competitors, as BRCO is part of CECO Group, they can order steel at exact lengths instead of industry standard lengths, removing the costs associated with cutting rebar and waste levels.
- Through talks with gravity base foundation manufacturers, BRCO have developed a new rebar product ‘Ellipse’, that is easier to bend compared to standard rebar allowing higher volumes to be produced faster.
- They are a vertically integrated company providing full visibility of the supply chain.
- All scrap steel is sourced within the UK.
- BRCO aim to use rail or sea to transport steel products depending on location.

Round three Crown Estate sites, in particular, Dogger Bank and Hornsea, comprise 9000MW and 4000MW respectively. With turbine innovations at present, it is likely that turbines in the range of 5MW will be used for these mentioned projects. Thus, Dogger Bank will require approximately 1800 turbines, and Hornsea, 800 turbines. At present,

there is a wide range of foundation solutions being used in the market; these include, monopiles, tripiles, jacket structures, and concrete gravity foundations.

This case study also involved several interviews with the director of the Concrete Centre, who heads the special interest group for concrete gravity foundations for the UK OSW market. In the first interest group meeting that took place in March 2011, the group discussed the likely supply overview of CGFs for round three projects. They agreed on an “optimistic” figure of 25% of all round three demand, in response to the Crown Estate’s requirement for an alternative to the structural steel solutions. Later in 2011 the group stated that 30% should be a “minimum” figure. In January 2013, the Crown Estate suggested the target should be raised to 40%. Considering these estimates, calculations were made as to the estimated number of CGFs that will be required for two specific round three projects; Dogger Bank and Hornsea. Table 3 below shows that in a low case scenario of 20% of demand being fulfilled with CGSs, the number of CGSs required is 520, while in the high case of 40% the number is 1040.

Wind farm	Capacity	No. Of turbines	CGF - Low (20%)	CGF - High (40%)
Dogger Bank	9000MW	1800	360	720
Hornsea	4000MW	800	160	320
Total	1.3GW	2600	520	1040

Table 3 CGF Demand estimates discussed at OSW SIG Meetings

Participant 3-1-2: “We have also invested through the funding application to get funding for machinery to make our new product, money that needs to be spent first before it is claimed back through the funding offered” “funding is retrospective.” One of BRCO’s customers GRCO received £660,000 from government industrial funds, that they claim has been more hassle than good, as they have had to explain exactly where that money has been spent. Participant 3-0-1: “But it is not easy to do that when you are developing a product. They’ve [GRCO] said, it’s a full-time job for someone to sit down and manage the claiming back of expenses.” Participant 3-1-3 visited Germany in 2011 to look at machinery with a spend of \$450,000 in mind (four machines); however, BRCO could only claim back the depreciation of those machines. Participant 3-1-3: “So you have to demonstrate the expenditure, pounds per hour per man etc. and then work out the

depreciation, then they may question the figure, so it goes back and forth, very cumbersome.”

Participant 3-1-3: “The time we invest in offshore wind is hundreds of thousands of pounds ... If we stop the steel mill in Cardiff to change the production line from standard rebar to trial 100 tonnes of BRCO new product, the mill reckon it will cost them more than £50,000 every time they do it, due to changeover, different billet/temperatures needed, also bending, moving around the factory, man hours, transportation ... After paying £50,000 to change production line which brings disruption to the factory, we then have to transport it to our fabrication yard in Mansfield to be radius bent, then you have four men working two days bending the rebar ... After that, it is transported back to the steel mill to be re-scrapped ... £200 per tonne can be knocked off due to it being re-scrapped ... So, the overall cost stands at around £30,000 ... So, for the trial run you have around 120 tonnes at £420 per tonne (£50,000) knock off, plus four men, plus transport etc.... A trial run for the Ellipse product will cost £80,000 per run plus man hours, transportation, disruption to the factory; that’s why we are going to TSB to look for funding as it is not cheap.”

Entering the offshore wind industry meant that BRCO had to form relationships with ports that would be involved in the installation and construction phases of UK offshore wind farms. This required key personnel from BRCO establishing and building close working relationships with UK port staff, not only in the UK but also in Scotland. Participant 3-0-1: “We also have good relationships with a local port and SRCO and similar relationships with Scottish ports. BRCO spent much time and effort to develop relationships with ABCO, a £450m port development located centrally in the UK on the South Bank of the River Humber. ABCO forms the UK’s largest developable land bank (366.7 hectares) with a deep-water frontage (1,389m) and provides a purpose built environmentally-friendly facility to suit the needs of the Offshore Marine Renewables Sector, especially OSW. ABCO is a nationally-supported development. Prime Minister David Cameron and Deputy Prime Minister Nick Clegg recently stated their public support for a positive planning determination: “...This [ABCO] is a very important investment. We all want to see the Humber estuary become a real magnet for investment, particularly green energy investment...” (Prime Minister David Cameron, 11th September 2013, PMQ).

Costing exercises took place between an ABCO and BRCO to demonstrate to BRCO customers that a manufacturing facility for concrete gravity bases could be set up on port-side to serve UK government round three demand. The exercise included costs that BRCO would incur; for example, the rent on facilities at the port, the machinery and staff invested into a facility as well as the port's costs. This would then be shown to BRCO customers to demonstrate BRCO willingness to invest in the relationship given that they would receive orders and build a long-term relationship with their customer. This showed the commitment that BRCO was willing to make towards its customers and showed a long-term vision of their relationship. BRCO demonstrated that they could set up a facility on the port for one of their customers that would reduce the logistics costs for steel tonnage that could be shipped in on barges from BRCO's main facility. However, when discussing the opportunity for BRCO to set-up a facility on port side, Participant 3-1-4 mentioned that a significant investment would be needed by BRCO and so they would require a long-term partnership with a CGF manufacturer with guaranteed order to make the investment feasible. Participant 3-1-4: "Machinery needs to be CE certified, which is costly, so unless they have a long-term order placed with customer, it is likely they will produce, cut and bend rebar at existing facilities and transport it to the port ready for assembly, where it will be fixed together. "The uncertainty within the OSW sector was high, with future pipelines for projects being changed regularly; however, the volumes that were being considered were still attractive for BRCO to invest in their OSW capabilities. Participant 3-1-4: "There was 48GW of Wind energy proposed; I think it will be more like 35GW and that is significantly large enough for us to be very interested in it ... We are looking at almost half a million tonnes of rebar over the duration of the construction phase ... and potentially double that ... The UK market is currently 700,000 tonnes a year."

This case study also involved a three-month project working with ABCO regarding setting up a facility to allow CGF manufacturers and associated supply chains to co-locate. The project involved working with the directors and business development staff at the port and discussing their requirements and demands for companies such as BRCO, as well as CGF manufacturers who were likely to set up port-side manufacturing facilities at the port. The project involved mapping potential supply chain solutions for the construction of CGF. This would involve all players in the supply chain, including cement suppliers, aggregate suppliers, and steel suppliers (see figure 20).

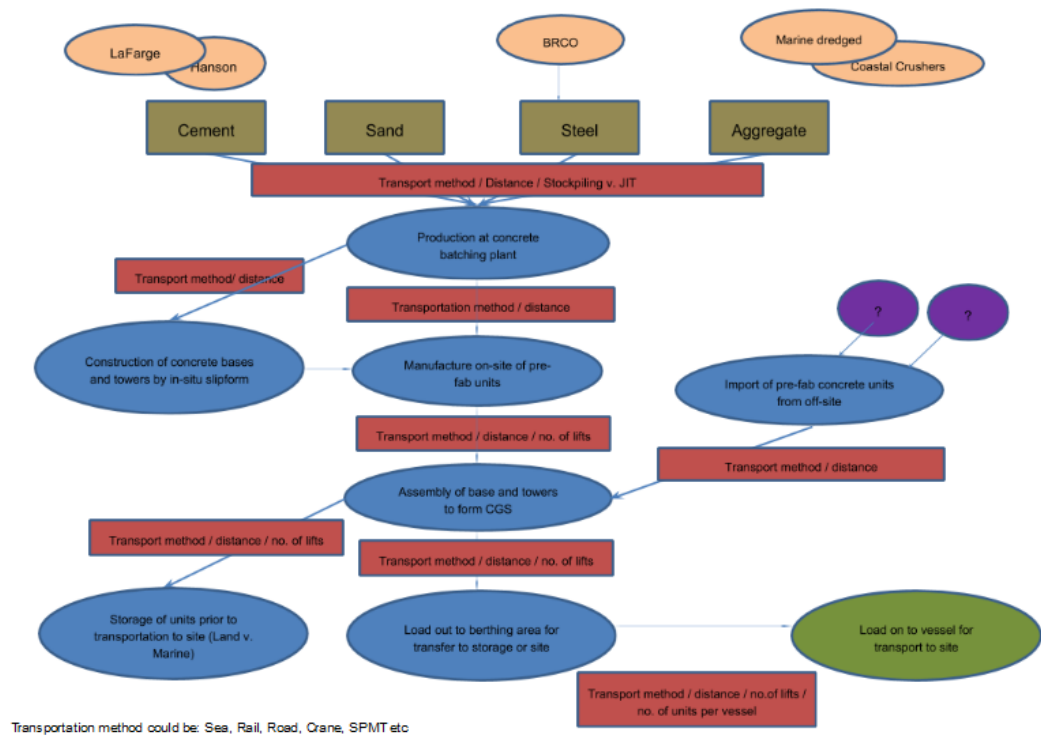


Figure 20 CGF supply chain structure

The study involved multiple meetings with port staff, and interviews with staff at aggregate and cement suppliers involved in the CGF SIG to map potential supply chain scenarios for the construction of CGF. The project aimed to show the benefits to CGF manufacturers and wind turbine manufacturers of adopting a UK-based supply chain with UK content, compared to sourcing outside of the UK. It demonstrated that all materials required for the construction of CGFs could be sourced in the UK, within close proximity of suggested port-side manufacturing facilities. This reduced the supply risk due to proximity of suppliers, but also demonstrated the ability to maximize UK content and use logistics solutions with a lower carbon footprint compared to foreign sourcing alternatives. For example, if BRCO did not invest in a port-side facility, there were other supply chain solutions where steel produced by BRCO could be transported from their main facility in Wales by rail to their facilities in the North of England, located very close to various potential UK offshore wind port developments. As all material required for the construction of CGF could be sourced in the UK, the project showed the potential for a very low-risk supply strategy that was vital for offshore wind construction timetables. It could then be transported by rail to port-side facilities. Another option for BRCO was to deliver their product by barge from their facilities in Wales to Northeast port locations, offering a low-cost transportation solution that had been demonstrated on the recent

London Olympics Games construction project. Figure 21 below illustrate some of the scenarios calculated during the project.

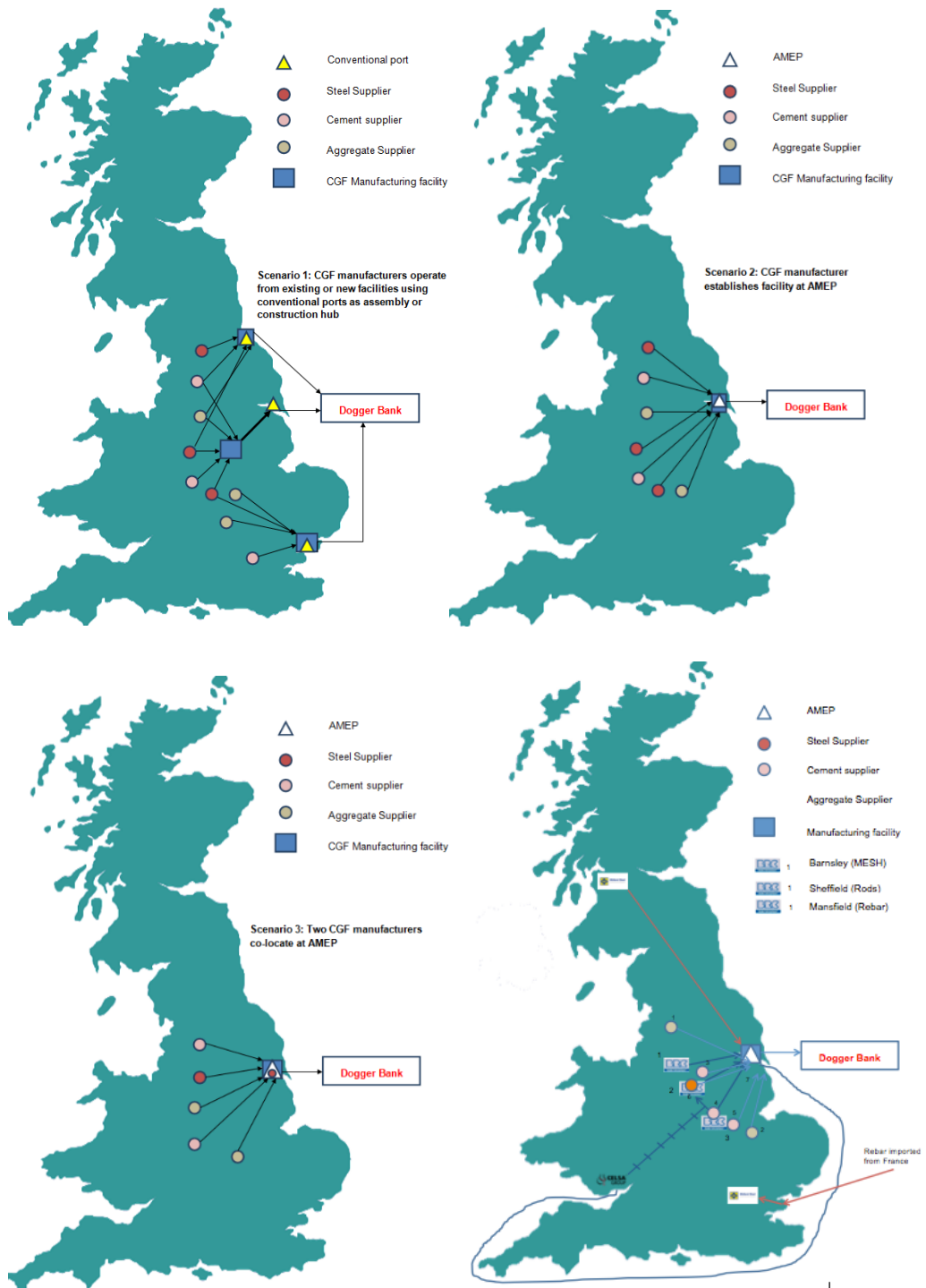


Figure 21 Scenarios for CGF supply chain

This included calculating distances and costs of numerous different supply routes and from numerous different suppliers to calculate the most cost-effective logistics solution (table 4 and figure 22).

Sustainable and responsible sourcing was at the heart of BRCO's business: BRCO's key account manager (Participant 3-1-4) was previously the chairman at the British Association of Reinforcement technical environmental and sustainability and health and safety committee. "We sign up sustainability charters as members within the room (Chinese import companies, ROM Group [no sustainability certifications at all – source from China], concrete centre etc.), where the members will agree and sign their organizations up to the sustainability charter." BRCO could supply all round 3 demand with gravity bases (6000); all the foundation material could be sourced from within the UK. Participant 3-0-1: "If we take a jacket for instance, it costs £5million, and most of the materials are imported from Korea or China; on the other hand, we have a concrete gravity base that costs £5million, creating 3000 jobs in the UK, with all materials being sourced from the UK, with half the carbon footprint ... With jacket structures, the cost will remain at £5million each, no matter how many are produced; however, as concrete gravity bases are a construction project, scale and repetition are key, and costs can be brought down by reducing construction time. ... it's a no brainer! ... The only reason you may choose a jacket over concrete is due to the seabed conditions (uneven surface)."

Several of BRCO's customers (SRCO and SKCO) are very supportive of BRCO's approach as they want a stable supply chain, BRCO gives them a better product, and due to offshore wind, a supply chain needs to be stable as they do not want to be waiting for a vessel. For example, a vessel cannot be late due to the tight construction schedules; thus, a just-in-time supply chain model is needed for concrete gravity base construction. Participant 3-1-4 mentioned that the sustainability argument over cost has worked. For example, express reinforcement was bidding against ROM group for a job for Cambridge University. ROM came in cheaper, but due to Express reinforcement mentioning the BES 6001 certification, having a sustainable supply chain but being a more expensive option, they still managed to win the tender against ROM. Participant 3-0-1: "So we are excited at the opportunity but we still don't have a customer ... Our customers are waiting on the energy companies to give the green light on projects such as Dogger Bank, as that will open up orders for say 500 gravity bases in various designs etc. Then the gravity solution providers will come to us to talk about rebar... We will most likely sit in a room with La Farge to talk about concrete, with PERI to talk about formwork, to sit together as a bunch of suppliers to work on a solution ... We have a big lump of the market; while some customers are wary that we have so much of the market and they don't trust it, we are

breaking down a few barriers now. Just because we have a large share does not mean we will be charging higher prices...”

Additional interviews were undertaken with the director of the concrete centre (Participant 3-1-4) who was responsible for running a special interest group for the manufacture of CGF. Participant 3-1-4 was a well-known figure in the UK engineering industry: he previously had roles in large engineering companies in the UK working on numerous projects including Crossrail and nuclear projects. At the time of interview, Participant 3-1-4 was running in the election to become the president of the UK Institute of Civil Engineers.

The concrete gravity foundation special interest group was composed of potential players involved in the CGF supply chain, meeting once every quarter to promote the use of CGF in the offshore wind industry, and to ensure the CGF suppliers could find the right partners to create a sufficient solution for the industry. The SIG acted as an intermediary between CGF manufacturers and turbine manufacturers; as the tower is the interface between both components and is usually owned by the turbine manufacturers, it was important that CGF and turbine manufacturers meet to share technical specifications, when discussing the nature of the offshore wind industry and the experience many of the companies had that were involved in the SIG. The director of the concrete centre mentioned that relationships between buyers and suppliers always required non-disclosure agreements. More specifically, the wind farm developers were demanding non-disclosure agreements from all their partners and suppliers.

Participant 3-1-4 also commented that turbine manufacturers were very secretive within the industry, and explained that not having wind manufacturers based in the UK as well as the need for UK suppliers to travel to European bases to share technical information, made the relationships much harder to bear. Secrecy and the unwillingness of players in the CGF supply chain to work together was also experienced from the aggregate suppliers, who would be supplying aggregate for the manufacturing of CGF. The aggregate suppliers frowned upon the suggestion by Participant 3-1-4 to collaborate with competitors and other players in the SIG, due to uncertainty in demand which they were worried they would incur a fight with some of the other members. The major wind developers wanted to see a fully working demonstration of a CGF; whilst they understood that CGF had been previously tested and successfully employed in the offshore oil and

gas industry, they were still adamant to see a fully working CGF designed for the offshore wind industry.

BRCO's key account manager explained that there were two sticking points when setting up relationships within the offshore wind sector. One was the will of political leaders, energy companies and investors in the industry; the other problem was that many of the customers were from typical construction industries and had not entered the offshore wind sector. Typical construction attitudes were still visible, where solution providers were adamant on using their own models to evaluate suppliers, and keep up to date with products, availability, and track inventory. This had the potential to introduce many problems, as normally a contractor would send out many surveys and questionnaires to their suppliers, in order to build a database of information regarding new products and their availability; however, the issue was that much of this information would be duplicated as all providers would use their own systems to record data.

BRCO also faced competition in the UK from the structural steel market. Participant 3-0-1: "The one big problem comes from the structural steel sector which is a huge market compared to the rebar market... and so players are sometimes doubting the use of gravity bases; however, there are over 300 gravity bases in use around the world already ... Structural steel sector saying, I wouldn't build it out of concrete if I were you ... While there are hundreds of voices saying that, there are only a dozen saying that concrete is a good option, longer lasting, more durable... Players may favour monopolies and complain about the fact that gravity bases have not been tested with 6MW turbines, but monopolies have also not been tested with 6MW turbines." Participant 3-1-2: "Customers keep asking for prototypes but gravity bases have been proven to work. Hinckley power station was built by BRCO; however, BRCO was not asked to build a prototype of that; similarly, for the River Severn Bridge, where BRCO built but didn't need to make a prototype."

The market BRCO operated in was not volatile and didn't spike or dip dramatically; therefore, BRCO operated with very low margins. In the past few years before this study was undertaken, market prices had been steadily increasing; however, the recent increase in Chinese imports of rebar had dropped prices in the market by 10-15% that resulted in BRCO's profit eroding. Previously, the UK market was buoyant and had needed to rely on imports from China; however, during the time of this study, the market was a lot smaller and Chinese imports were still coming into the UK in vast volumes, so the UK market was getting considerably worse. Contrary to BRCO's rebar, although Chinese

rebar was cheaper, it was carbon intensive, had no sustainability certifications and had a supply chain carrying high risks due to US dollar and iron ore price fluctuations. Due to the cheap Chinese imports, BRCO had to take jobs at a loss to keep their factories running.

BRCO's key account manager (participant 3-1-2): "We have a two-tier market, one of BRCO rebar and imports, it is split straight down the middle ... Imports from China and Turkey are still having an impact on the UK rebar market. Factors include weakening of the pound, lower iron ore price, Chinese market slowing down ... The average import figure for rebar in the UK is around 20%. Jamie mentions that currently it is at around 35%, possibly even 40% "which is a pain ... BRCO supply the rest of it." BRCO's key account manager explained to potential customers that if the import market kept growing, there was a distinct possibility that BRCO's parent company in the UK could be shut down; therefore, their customers would have to rely on their other parent companies based in Spain/ France/ Nordics to supply rebar to the UK market. Participant 3-0-1: "Our head company CECO is the only steel mill producing rebar in the UK ... When we explain to our customers about the rising import market we say, 'Without a rebar mill, suddenly the UK will become like Ireland, which doesn't have a rebar mill, and is a free for all, it's like the wild west!'"

Some of BRCO's prospective customers showed their intentions to not let this happen and showed their support of the UK steel sector. Participant 3-1-2: "We don't expect to be used as a sole supplier, but we believe that customers should commit to buying some of their products from the UK market, as long as the price is not ridiculously high. It's a strange thing, when we have had Chinese imports in the past, we have had a buoyant market, so the UK has had to import in order to satisfy demand ... At the moment, the market is a lot smaller than it has been in previous years. It's strange having imports coming into an unhealthy UK market. It is making the market worse ... What would improve the situation (make the market buoyant again) is if we didn't have as many Chinese imports dragging the prices down ... The work and market are recovering and getting better but the prices are still going down, which is the opposite of what should be happening."

Previously, BRCO did buy rebar from China; however, this was done when the UK market needed it, and BRCO's key account manager went over to China to work with the supplier on certifying the sustainability of their products. BRCO's director, Participant 3-0-1: "We have 60% of the rebar market and there are many good independent fabricators

in the UK so it is disappointing that Chinese imports have been chosen so keenly... The Chinese rebar product have responsible sourcing sustainability issues to take into consideration. It has disappointed us that the middle ground companies have decided to take the money and run ... They can see that buying Chinese imports is not in the interest of the UK PLC, of sustainability ... Short-term, you may make a few quid from buying imported rebar.... However, this may stop. The dollar only has to move a little or the iron ore price move a little and then China will not be interested in the UK market ... Then where will these companies buy their rebar?"

Figure 23 provides a simple illustration of BRCOs supply chain in comparison with its Chinese competitor's supply chain (figure 24).

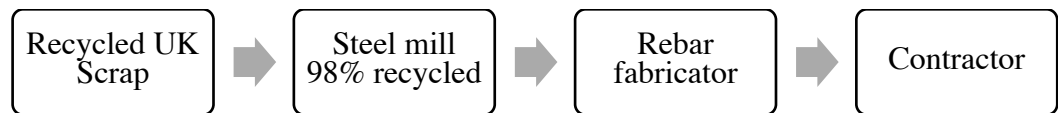


Figure 23 BRCO supply chain

100% visibility of supply chain; 100% UK content; 100% safe supply chain; 650 kg CO₂ per tonne end-to-end; Approximately £535 per tonne finished product; Rebar certified to BES 6001 by UK CARES.

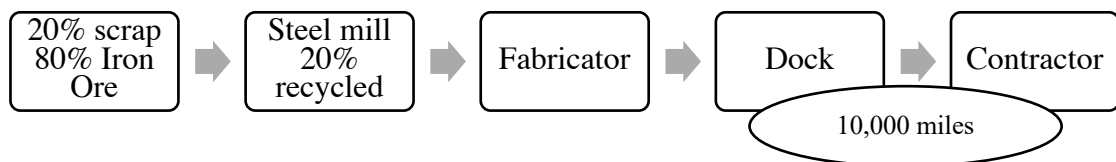


Figure 24 Chinese competitor supply chain

Iron ore sourced from Brazil, Australia, Africa and transported to China; The iron ore needs to be dug out and processed, and is four to five times more damaging in terms of carbon emissions; Iron ore source unknown; Unlikely to increase recycled content; Unlike UK, China does not create much scrap metal; the UK produces approximately 12,000,000 tonnes per year of which 2 million tonnes is used by CECO, and then the rest may be exported to China, and finally shipped back to UK as finished product; Chinese rebar has some of the certifications that BRCO rebar has; UK CARES is a steel reinforcement certification body. Chinese rebar has CARES UK approved quality certification, but no sustainability certifications such as BES 6001; A conservative estimate of the carbon footprint for Chinese rebar is 2.6 tonnes per tonne of rebar; that is making conservative assumptions, such as shipping iron ore from Australia and not

Brazil. BRCO's director stressed the disadvantages of their Chinese competitor's supply chain and product, stating it was full of risk mainly due to three factors:

1. Dollar
2. Iron ore price
3. "The Chinese are fickle"

Participant 3-0-1: "When the dollar or iron ore prices change, it will become more attractive to sell rebar to other markets such as Japan; this makes the Chinese import supply chain unsafe ... That's what I'm trying to get across to these companies, but it is not easy, because someone is making a lot of money doing it. So, it is very frustrating but we will continue doing what we do ... There is an 11 million tonne market for steel in UK; in China, it is more than a billion tonnes. If you buy cheap you buy twice; this could be the scenario for Chinese imports ... It's short-termism ... The reason why Chinese imports are still considered is due to price; however, while fabricators are happy buying Chinese rebar, once the Chinese find a more attractive market, it is likely that fabricators will turn back to BRCO. However, instead of paying, for example, £535 per tonne, which was more expensive than the Chinese option, BRCO are more likely to increase this to £635 per tonne." After discussions with the technical chairman of BAR, BRCO's key account manager discovered that he wanted to resign as he felt he could not put his name down to the sustainability charter when members were signing up to the charter, and did not comply with it. These members would then purchase steel products from ROM Group or Chinese rebar which didn't comply with BAR sustainability charter. Commenting on the technical chairman, Participant 3-0-1: "He cannot tell a member not to buy from these suppliers ... Due to this fact, if this wasn't the case, the price may be around £550 per tonne, which would mean everyone in the market would be making a reasonable profit ... Members are putting their business at risk by buying from ROM Group and Chinese for short-term gain."

Participant 3-0-1: "We have a lot of potential customers, especially in Scotland because they seem to be a little more proactive than the UK Government ... The UK has signed off around 10 energy projects; three or four of these projects were Scottish but were not included in the sign off, and the reason for that is political. It's because the UK Government is not going to support anything the Scottish government are proposing until it is clear on how the independence argument will play out ... What this has done is pause the development of Scottish wind projects for at least 12 months."

BRCO's staff spent time visiting prospective customers (BAMCO, SKANCO) based in Scotland who were working on the Beatrice Wind in Northern Scotland, to provide concrete gravity bases, but all of a sudden, talks were stopped due to the political situation in Scotland. Participant 3-1-2: "The problem is, you only have to read the press ... You have extreme views from the Daily Mail and Daily Telegraph that are anti-renewable then you have The Times, The Guardian and The Independent saying it is sensible ... And the government sit in the middle ... Some nuclear. where it looks like three power stations will be built supplying 20% of our energy need, 20-25% from wind whether onshore or offshore ... This would downscale what we have in the pipeline for offshore wind by around 30%, but the size of the market would still be massive ... Then you have coal and fracking, which in my opinion is not a sensible option ... But you have people in Westminster saying that offshore wind is expensive to set up; however, theoretically, after 10 years of setting up a wind farm, the electricity generated has paid for itself ... Nuclear for example is costing around £15 billion for Hinckley power station, while fracking is very cheap. So, in these economic times (high energy bills), people are likely to choose fracking just because it's cheap."

Energy in the UK costs BRCO £65 (£30 is tax) per tonne, while in China it is £15 per tonne (no tax); £50 difference (approx. £30 tax). Participant 3-1-2: "If the tax was held back by the Chancellor we would be on a level playing field with the Chinese ... the Chancellor has held the cost of energy back, as we pleaded with him to do so;, we and TACO told the Chancellor, 'These carbon taxes are crippling us.'" Participant 3-1-4: "The Chancellor has agreed to hold back the tax, which is helpful but benefits are only realized in 2017 ... We won't get in front of the import market because the taxes are capped and we still pay the same amount today. The Chancellor will knock the price back over the next coming years." Participant 3-1-7: "Bankers want to know that they will get a return on their investment; I think this is unfair as investments will go one way or the other. It is like saying to a bookmaker, I want £20 on the Grand National, but if my horse falls, I want my money back ... It's not really fair."

Participant 3-0-1 commented: "It is still very early... we have had a lot of contact in offshore wind but until someone presses then green button on a major project like Hornsea or Dogger Bank, we don't have a customer. We are not holding the trigger to the gun ... We all know what we can offer to each other, and what each other is capable of; we are now just waiting for the green light ... It is frustrating but you can understand it as it's a big investment; we are talking tens of billions of pounds ... These things tend to take time

to get the go ahead and when they do, everyone wants to start it tomorrow ... I imagine when the green light comes, there will be a flurry of activity and we will be starting to construct within 6 months ... I have witnessed this from experience ... It is a similar situation to Hinckley power station where we provided the rebar; we were all ready but waiting for the green light.”

4.1.3.1 Case #3.1

This case analysis the relationship between BRCO, the focal firm and supplier, and GRCO, the customer. Participants interviewed for this case include: 3-0-1: BRCO OSW operations director; 3-1-2: BRCO Key account manager; 3-1-3: BRCO Technical product manager and 3-1-8: GRCO commercial director. More details about the interviews can be found in Appendix 6.

GRCO was an experienced market leading Construction Company but had never undertaken a project in the offshore wind industry. Both BRCO and GRCO had been aware of each other years previously, as they would be involved in other industries such as the construction industry, rail, and road projects. This initiative involved staff in other departments of the organizations, while the offshore wind departments were newly developed teams in both organizations. GRCO were attempting to enter the offshore wind industry as a concrete gravity solution provider; their customers would be the developers, also known as the big energy companies. GRCO were looking to develop a supply chain for CGS that involved relationships with UK ports, steel manufacturers, aggregate and concrete suppliers and fabricators. When it came to identifying steel suppliers, GRCO had a choice of two main suppliers in the UK as well as suppliers based in China, Turkey and Poland.

Awareness stage

BRCO staff first met GRCO at an offshore wind conference in early 2010; contact information was exchanged and BRCO staff felt they had left a good first impression with GRCO. After the conference, BRCO contacted GRCO and suggested a formal meeting take place, for BRCO to give a presentation on their product and to explore possibilities of working together to supply concrete gravity solutions for the UK’s round three offshore wind projects. GRCO had vast knowledge repositories and experience in design work. They had a partnership with a worldwide reputed construction designer, who had thousands of extremely qualified engineers at their disposal. BRCO’s key account

manager was already aware of GRCO impressive technical capabilities; Participant 3-1-2: “They can design gravity bases without the need for prototyping.”

GRCO agreed and invited BRCO to their offices in London, where the key account manager and two technical team members gave a presentation on BRCO’s history, experience, and key capabilities. During the meeting, GRCO shared the design specifications of the current design of their CGF. Along with the technical team, the key account manager of BRCO suggested they would like to take GRCO’s design back to their facilities and work on it, to show where it could be improved with BRCO knowledge of steel and manufacturing processes involved. Several months later the supplier visited the buyer at their headquarters in Germany for a formal meeting to discuss design specifications and capabilities of the two companies.

When staff from each company met face to face at GRCO headquarters, a close social bond began immediately. During the meeting GRCO shared information on the design specifications of the concrete gravity solution they were going to propose to their potential customers, the developers. BRCO explained that they had a lot of knowledge and experience in the steel industry, especially in the reinforcement sector; they had strong technical and design knowledge, knowing the best time to buy in the market; also, the ability to offer low risk supply chain solutions and being UK-based, design capabilities were key complementarities to bring to the relationship. BRCO’s director convinced GRCO to share their CGF design specifications to attempt to improve the design in terms of cost and speed to manufacture.

Exploration stage

After several months, a second meeting was suggested where GRCO wanted to explain their requirements from a potential supplier such as BRCO; what they expected in a feasible supplier; the goals of the organization; also, what complementary resources BRCO could bring to their relationship; and to seek common ground between the organizations and personnel. BRCO had been developing a new product especially for the offshore wind industry that had been in early development stages but nearing prototype stage. In the second meeting BRCO introduced their new steel bar product that was in prototype stage. They presented the product and shared information with GRCO about its design and features and how it could offer GRCO an advantage in their bids to customers such as developers. BRCO technical team started to redevelop the GRCO

design over several months, that involved contacting GRCO technical staff, developing social bonds between the two organizations.

In 2012, the BRCO visited the GRCO's HQ to give a presentation on their new product that they suggested could be used in the prototype, due to its benefits of needing less rebar and being produced at a faster rate, shaving approximately 10% off the cost of the customer's original design. Participant 3-1-2: "We are not trying to sell them a product; we are trying to sell them less of it, unlike our competitors who may add on more rebar to the design to make more money." GRCO saw the ability of the supplier to add value to the relationship, so they decided to arrange several meetings to discuss the building of a prototype CGF together. This started the exploration stage. After several months BRCO created a new CGF design that resulted in using 10% less rebar, which not only saved costs in terms of less rebar but also improved the build time of the CGF.

This gave GRCO confidence in the capabilities of BRCO and identified common ground between the two companies, where they both offered mutual benefits to each other. Meetings between key account managers, technical staff, and logistics managers carried on throughout 2011, developing relationship specific routines and bonding socially, until senior management from both companies decided to meet in order to discuss discounts regarding the building of a prototype; Participant 3-0-1: "This escalated the relationship to a higher level." In 2013, a major presentation to GRCO's board was given by BRCO directors and technical team to give information on their BRCO Ellipse product and how it could improve the quality and cost of GRCO's CGS. BRCO introduced the idea of a joint initiative that would focus on improving the build time of their CGS, with any savings split evenly between the companies. Participant 3-1-2: "We told them we will get onsite, build two or three units; after three we will measure how long it takes to build, say 27 weeks to build the fourth, 27 for the fifth, 26 for the sixth ... and we get it down to 25 weeks eventually. We have shaved three weeks off the build ... We then quantify what cost savings have been achieved through the reduction in build time e.g. labour etc. That figure might be £80,000 ... What we want to do then is say to the customers, you give us half of that for every build achieved in 25 weeks, so what we do is share the benefit of using our new product."

To show their commitment and views of a long-term partnership with GRCO, BRCO suggested a rebate system, where if they could reduce the amount of time taken to build a CGS then the cost savings would be quantified and for each CGS built within that

specified time, both companies would share the costs saved. BRCO's director commented: "It is an incentive for everybody to get it right." In early 2013, the supplier offered a formal discount to the customer for the building of a prototype; Participant 3-0-1: "BRCO has offered support to these key players in terms of giving discount on their rebar for demonstration projects ... We want any one of these companies to build one and stick it in the water and say that it works." GRCO was impressed by BRCO dedication to the project and willingness to share information and knowledge with them to improve their product as well as logistics capabilities. They also liked the idea of sharing the rewards of any innovations or improvements made on the project. This brought a lot of common ground between the two companies. GRCO then enquired to BRCO for quotes on several offshore wind projects. BRCO produced the quotes and sent them over to GRCO. In their tender to the energy companies, GRCO included their quote for rebar but explained how they may be able to reduce the cost by 10% using BRCO's new product.

Expansion stage

Due to the close bonds between the two companies, BRCO offered \$200,000 of their funding to GRCO to put towards the building of their prototype. This triggered the start of the expansion stage, as the customer then made a commitment to the supplier to build their prototype. BRCO then asked GRCO to write a formal letter of support for their funding application to the TSB, which the customer was happy to do. GRCO signed the letter of support for BRCO new product funding application, a commitment to involve them in the project. Participant 3-1-2: "He is older than me but has a young outlook; he is a reluctant collaborator but knows that he has to collaborate for the projects to work ... GRCO were the proactive company who offered to give BRCO's product a letter of support, unlike the other companies ... The best relationship we have is with GRCO, the director and I are good friends ... He is a very difficult individual but we are similar people so we get on well ... The UK director of GRCO is the reason why GRCO has written a letter of support for the development and testing of BRCO's product." The trust was reciprocated when BRCO said they would share any further funding they received with GRCO. Participant 3-1-2: "I said to GRCO's director: "If we get another £300,000 funding and you do want to build a prototype, you can have some of the funding."

A month later, the funding application was submitted by four companies, CECO (steel mill), BRCO (fabricator), ARCO (material testing facility, Wales), and the welding institute to test BRCO's new product. All four companies submitted a joint funding

application for BRCO’s new product. After the submitting the application, GRCO were a bit quiet in late 2013 but enquired and asked for support for quotes on several wind farms. GRCO had made a commitment to sourcing most their steel from the UK market, which aligned with the supplier’s strategy of increasing UK content and ensuring sustainable sourcing of steel. They recognized that BRCO also shared the same values and goals and could support their strategy. One sticking point for BRCO was that GRCO was a tougher negotiator than some of their other customers: even with close personal relationships, negotiations would be a challenge. GRCO demanded all the sustainability features that BRCO had, but wanted them at a lower price than was offered. BRCO’s director (participant 3-0-1): “GRCO are more maverick, and they will choose to take the sustainability route with BRCO; however, they are likely to squeeze the price down.”

BRCO sold their steel at £500 per tonne while imports were £465 per tonne but without the sustainability features. GRCO asked BRCO to reduce the price to \$465 to match the import steel price but BRCO declined. Instead they compromised and lowered their original price from £500 to £490. This reduction was possible as BRCO stated they were reliant on GRCO, so it was important to keep them happy by making a small discount. Participant 3-1-3: “We are all in it to make money.” The relationship between the two companies was not able to grow further due to uncertainty in the industry. As a result of political uncertainty, the customer put their operations on hold; the customer’s commercial director (participant 3-1-8) commented, “We are not doing anything until we get an order for a reasonable number of CGF, 300 at least.” Figure 25 below illustrates the relationship development timeline between BRCO and GRCO.

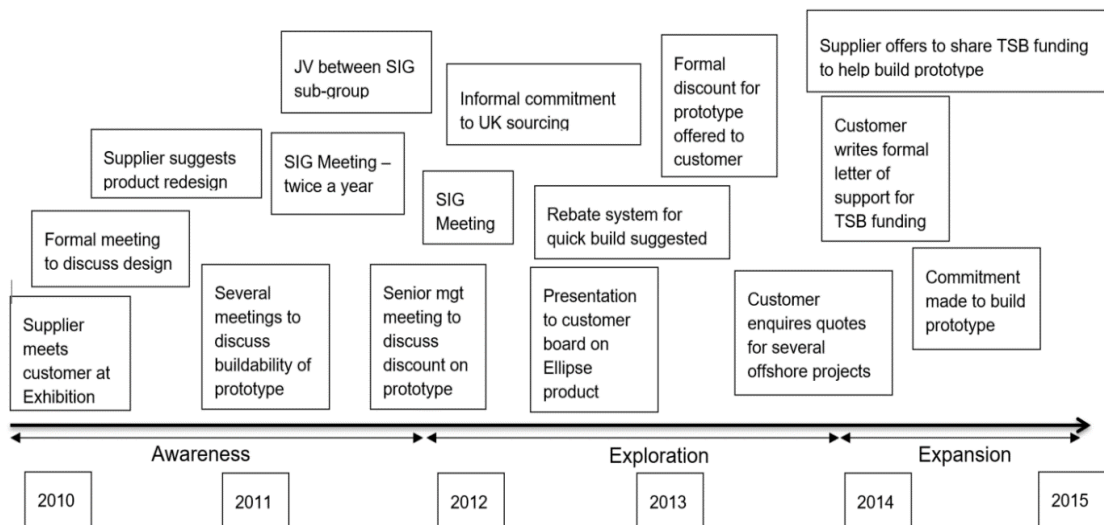


Figure 25 BRCO – GRCO relationship development timeline

4.1.3.2 Case #3.2

This case analyses BRCO as the focal firm and supplier to STRCO, the customer. The following participants were interviewed: 3-1-2: BRCO Key account manager and 3-1-3: BRCO Technical product manager. Further details about the interviews can be found in Appendix 6.

STRCO was a European construction company based in Austria, with headquarters in Vienna. STRCO was founded in 1835 and was the largest construction company in Austria and one of the largest construction companies in Europe. Most services offered by STRCO included building construction, civil engineering, infrastructure construction and facility management. STRCO's revenue in 2010 was €12.38 billion, total assets €10.38 billion, and number of employees was 76,100. STRCO had strong technical knowledge and in-house design department that had experience with many elements associated with OSW. For example, they specialized in offshore logistics, scour protection, soil mechanics, scatter diagrams for waves, aerodynamics, and load spectrums for wind, to name a few. Prior to UK OSW developments, STRCO had helped set up a OSW construction project in Europe. STRCO's managing director saw the upcoming UK OSW sector as a €50 billion plus market and one which would require a long-term investment of 25-30 years (taken from STRCO's managing director's conference presentation).

Awareness stage

BRCO were first aware of STRCO when they were working on large construction contracts outside the offshore wind industry. In late 2011, STRCO were making signals in the market that they were aiming to enter the UK offshore wind industry by setting up construction facilities to supply CGF. This required searching suppliers of steel bar for their proposed CGF design. The two companies first met face-to-face when personnel from both organizations were invited to a special interest group, that promoted the use of concrete gravity foundations in offshore wind and involved all tiers of the supply chain that were involved in manufacturing CGF. During the interest group, BRCO explained that they could offer STRCO a stable, low-risk supply chain solution, as well as offer their expertise and experience in the steel industry to ensure that STRCO would have a competitive advantage compared to their competitors. A few weeks after the interest group meeting, BRCO contacted STRCO to arrange a meeting to present their products to STRCO and explain potential future collaboration. STRCO invited BRCO personnel

to their headquarters in Germany where they had a working CGF prototype built and on display.

Exploration stage

BRCO sent their key account manager along with two technical personnel to STRCO headquarters where they met with STRCO's director, design team and logistics manager. The aim of the meeting was to analyse STRCO current CGF design to see whether BRCO could introduce any improvements and suggest what specification steel would be best, as well as the logistics involved with delivering the steel to STRCO's manufacturing facilities. BRCO's complementary technical knowledge played a big role in redesigning STRCO's original design, and made a large contribution in terms of time and personnel dedicated to working with STRCO teams on many levels. BRCO was very willing to share high-quality information with STRCO to improve their product; this was reciprocated by STRCO who shared all design specifications and deeper organizational routines.

STRCO's CGF design was a tapered design, which immediately stood out to BRCO technical personnel, who highlighted that STRCO design was lowering costs by using less concrete and steel; however, they did not consider the construction time required with this particular design, which, when considered, made the design not feasible. STRCO staff were shocked. BRCO had shown they could improve STRCO performance with their technical knowledge that was complementary to the relationship. Participant 3-1-3: "They believed they were saving money by tapering it as the CGF will require less concrete and steel; our team of designers and technicians showed the customer that the construction time would be long and costly, and recommended that they avoid using a tapered design." STRCO's CGF prototype design had a circular base, which required radius bent steel bar, which at the time was a relatively new product on the steel market and was not produced in the UK. BRCO design team discussed and worked on the CGF design with the STRCO design team during the two-day meeting and introduced a major improvement that could be made. Instead of using radius bent steel bar, STRCO could change the design of the base from a circular shape to an angled base; this meant that STRCO could save a lot of money as it would require less rebar than their original design.

BRCO explained to STRCO that they would invest a lot of effort and use their strong partnerships with a wide range of different construction specialists to organize a joint initiative to redesign the product. The construction of CGF would require concrete

specialists, slip forming specialists, and rebar specialists, all of which BRCO had strong relationships with and so the initiative would build on BRCO relationships. The initiative would get all four players together to discuss the solution from all three viewpoints; BRCO's director and key account manager personally guaranteed STRCO's director that this would improve their CGF design and make it quicker to construct. This strengthened the trust of STRCO and the commitment BRCO showed to developing their relationship together.

Four months later and several visits from BRCO's design team co-designing with STRCO's design team, resulted in changing the CGF design to feature an angular base; this would require a lot less steel bar and saved STRCO a lot of money. BRCO offered complementary resource through technical knowledge on the product, where BRCO recommended that STRCO use a higher grade of steel that would need less rebar. One example, Participant 3-1-3: "A solution requiring 850t of 500 grade steel can be reduced to 790t using 600 grade steel. A 60t reduction in rebar is a significant saving, not only in price paid but also when you take into consideration transportation, storing it, and fixing it." The quality of the personal relationships between the two companies increased as BRCO proved that they were willing to share the rewards of their knowledge with STRCO and build on a mutual goal of a long-term relationship together.

BRCO's technical knowledge impressed STRCO and showed they were a feasible exchange partner. STRCO's trust in BRCO capabilities increased as well as the personal level trust between staff of each organization. There was now a lot of social bonding between staff and relationship specific routines were beginning to emerge. BRCO offered resource complementarity through its numerous facilities located strategically around the UK and so it was able to provide cost effective and sure supply chain solutions to get their product to the customer's facility. The steel bar would be delivered by rail to three suggested port locations; BRCO were also able to deliver the steel bar by barge from their facility to any port in the UK. A key selling point was BRCO's location that enabled it, compared to its foreign competitors, to offer a on low-risk supply chain solution, which was crucial to offshore wind construction and installation schedules. BRCO market complementary enabled them to offer just-in-time deliveries, and BRCO could also take responsibility for the sourcing of steel. With their vast knowledge and experience, they could pre-purchase the steel on behalf of STRCO when it was at a market low and store it for them. Further, to show their commitment to the relationship, BRCO would share these savings with their customer.

On a personal level, the director of STRCO and BRCO's key account manager had a close relationship: they both saw eye-to-eye and felt they could trust one another. Visits between the two organizations became frequent; STRCO directors and design teams would visit BRCO facilities, and key account managers and technical personnel from BRCO would visit STRCO headquarters in Hamburg and in Cuxhaven over a year and a half period. They started to work on co-designing how the CGF could be serial manufactured. When discussing each organization's goals and values, much compatibility arose. Firstly, both organizations were driven on sustainable sourcing which instantly drew common ground. Unlike other customers BRCO had, BRCO's key account manager believed that STRCO were being true to their word. This was proven when it came to discussing prices for BRCO product: STRCO were happy to pay the price BRCO offered and would be purchasing 100% of their steel bar from BRCO and not from abroad, where sustainable sourcing was questionable.

BRCO used a UK construction industry tool, BIM (Building Information Modelling), that helped track products across the whole supply chain maximizing logistics capabilities, while on the other hand, STRCO were a German company that had not adapted the BIM model, due to it being specific to UK construction industries. BRCO explained that by adopting BIM, STRCO would have a transparent picture of the supply chain that would improve the efficiency of their production and inventory capabilities; however, it would need investment. Adopting BIM would increase the compatibility of resources between the two organizations and improve the efficiency of their construction schedules, especially as STRCO wanted to undertake serial production of CGF. BRCO believed STRCO were most likely to invest in BIM and use this in collaboration with their future supplier; however, the investment involved would need to be justified by a large order from their customer, the developer. STRCO were most likely to invest; Participant 3-1-2: "STRCO are a big company, and they won't want to be left behind when all the others have adopted BIM."

In March 2014, STRCO enquired to BRCO for more quotes to supply to a round three UK offshore wind farm that was in the process of being green-lighted. BRCO received the order on the telephone from the director of STRCO for pricing up investment required for the construction of 350 CGF. BRCO's key account manager worked alongside his logistics and technical team to create solutions for potential logistics routes, as a port manufacturing location had not been chosen, so it was vital for BRCO to maintain and keep discussions open with around five port operators and owners. This required

investment from BRCO, to meet with the operators to discuss pricing strategies cost structures as well as the logistics solutions required. BRCO believed they had gained the trust of STRCO and were hoping that this order would be the start of a strategic partnership with STRCO. Unfortunately, the political uncertainty regarding offshore wind led the developers of the round three wind farm to put the project on hold; this fed down to STRCO and ultimately to BRCO, which was extremely bad news for all organizations involved in the supply chain.

Since then, both organizations maintained their open working relationship, however, after the design work involving both teams integrating together for a solution with constant communication and site visits. This all started to reduce; there was now less need to visit each other; they both understood each other’s capabilities and what each other could bring to the relationship. They both recognized that they had strong cultural compatibility, not only through the values that each company and its staff stood for, but also through the strong personal relationships between the staff of each organization; there was trust on a personal level, but also signs of benevolent trust and good will. Both organizations were willing to share information of high quality to each other, and would take on risks and share rewards together, each bringing complementary resources to the relationship. Both organizations accepted that it was not in their hands anymore and they were waiting for political uncertainty in the market to clear. Figure 26 illustrates the relationship development timeline between BRCO and STRCO.

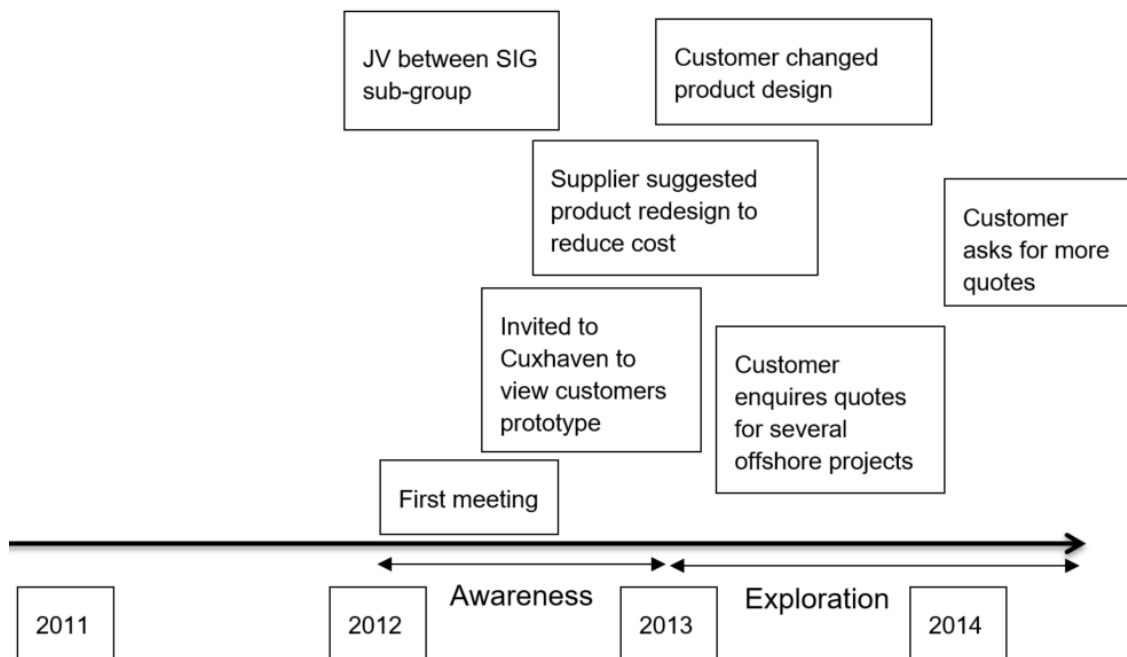


Figure 26 BRCO – STRCO relationship development timeline

4.1.3.3 Case #3.3

This case analyses the relationship between BRCO (focal firm) as a supplier to SKACO, the customer. The following participants were interviewed: 3-0-1: BRCO OSW operations director; 3-1-2 and BRCO Key account manager. Further details about the interviews can be found in Appendix 6.

SKANCO was founded in 1887 and is one of the world's leading project development and construction companies. It employs approximately 57,000 employees worldwide and is headquartered in Sweden. Before starting their relationship in the OSW sector, BRCO and SKANCO had worked together for many years on other projects in the rail and road construction sectors.

Awareness stage

A year before their meeting, they had an incident where a competitor of BRCO raised a complaint with SKANCO regarding sustainable sourcing. The complaint involved a SKANCO procurement director who was working with BRCO's key account manager after they had won an order to supply a rail project SKANCO was working on. BRCO was in competition for the order they eventually won; however, their competitor, who lost the bid, sent a formal complaint to SKANCO suggesting that they were dealing with BRCO based on relationship only and not on price. This resulted in an official complaint, requiring SKANCO to bring over their HR people from Sweden and psychologists to go through a process with the SKANCO buyer, who was noted to be one of the most respected people in the industry. The individual was off for six months due to this; the case went through and he was found not guilty. Participant 3-1-2: "He dealt with us because we are offering a partnership that not only focuses on price but value added of the services we provide ... The competitor who raised the formal complaint did so because his product was cheaper; he didn't understand that just because it is cheaper does not necessarily mean it is the best choice, due to requirements of sustainability and responsible sourcing."

This provided strong evidence for the importance of personal relationships and cultural compatibility between the two organizations. A key priority for both was sustainable and responsible sourcing; they both had substantial knowledge of each other's capabilities, as well as developed relationship-specific routines from the previous project they had worked together on. This resulted in a two-way dialogue between the organizations; both sides were willing to share any information required from the partners spanning years

before entering the offshore wind industry. BRCO was very impressed with SKANCO sustainability charters and commitment to UK sourcing and responsible sourcing. Commenting on SKANCO HQ in North London, Participant 3-0-1: “You walk through the doors and it just shouts sustainability and responsible sourcing. It’s all over everything you see – there are statements, murals, pictures, big screens talking about the environment, and the responsibility to be the greenest, most thoughtful, sustainable contractor in the world ... It’s incredible, it’s like going to a parallel universe ... It’s one of the few places where you walk in and believe that they are committed to what they say ... “When I walk into SKANCO office block with 300 or so employees, I don’t doubt that every one of them has bought into the sustainability and responsible sourcing ethics and values.”

Participant 3-0-1 first met SKANCO regarding offshore wind in mid 2011, when he paid a visit to SKANCO HQ to discuss future plans for the offshore wind market and the potential for working together on upcoming UK round three projects. BRCO recommended that SKANCO join an offshore wind industry special interest group on CGF, that would help them better understand the requirements and roles of each player in the CGF supply chain. SKANCO accepted the offer and two weeks later they attended the SIG; during the group session BRCO introduced SKANCO to a concrete specialist and a fabricator specialist, and used the session to form an integration initiative together to work on a developing prototype design for SKANCO. BRCO demonstrated their commitment to helping SKANCO develop the prototype and to start discussions regarding aligning the goals of the two organizations and building relationship-specific routines.

Exploration stage

The joint initiative formed from the SIG started to undertake visits to each of the player’s facilities and undertook sessions with the technical teams involved, to exchange knowledge on different production techniques for concrete, steel, and fabrication methods. There was a key staff member from each organization, which met every month to discuss new suggestions for improvements in design. All players were keen to share information with each other, including cost information that enabled them to share rewards from future orders if successful. There was a lot of common ground between them members and trust quickly built. The joint initiative members all agreed that UK sourcing was a priority that developed a basis for mutual goals to be built on. SKANCO

was very interested in the sustainability credentials of BRCO steels and wanted to use that as a key selling point to their customers, the developers. Participant 3-0-1: “There is support for BRCO’s sustainability and recycled content approach. SKANCO are very supportive of what we are trying to do and achieve with recycled content.”

This showed BRCO as a feasible supplier to SKANCO offering complementary resources in terms of the sustainability credentials of their product, and BRCO’s market knowledge and commitment to helping SKANCO improve the design of its prototype. The meetings helped SKANCO remove a lot of uncertainty regarding the product and provided them with expert knowledge that would improve their product and reduce their costs. It would also help SKANCO form the bid to the developers for large contracts involving several offshore wind farms, as they could map out the costs involved at each tier of the supply chain and provide the developers with the confidence that the players involved were capable. After BRCO proposed that their new product would reduce the amount of material needed in the CGF design by up to 10%, SKANCO decided to include this potential reduction in costs in their tender to the developers of offshore wind farms.

To further show their commitment, BRCO made an informal commitment to offer a discount on their new product for the SKANCO prototype if they required. BRCO offered complementary knowledge on different product features that would offer SKANCO significant savings; for example, BRCO suggested SKANCO use the higher-grade steel rather than the cheaper lower grade to save costs through requiring less steel bar for CGF, but also saving SKANCO costs in transportation, storage, and fabricating it. This resulted in SKANCO making a bid to BRCO for only the high (600) grade steel, as they were confident in BRCO’s technical knowledge and capabilities and trusted their recommendations, which were unlike BRCO’s other customers who opted for a mixture of the two. Relationship quality was high as there were mutual goals set in place as the joint initiative took place over several months. The personal relationship between country directors of SKANCO and BRCO directors was strong. Both organizations shared compatible goals where their main priorities were recycled content, UK content, and the carbon footprint of the product offering. SKANCO decided to ask BRCO to quote them for a bid they were to submit to the developers of upcoming Scottish offshore wind farm projects.

BRCO prepared a thorough analysis of the costs involved and provided SKANCO with a quote. However, a month afterwards, the political situation with the Scottish referendum

put all talks about Scottish wind farm projects being developed on hold, as uncertainty regarding electricity market reform also introduced a lot of uncertainty; so SKANCO's customer was not able to provide feedback on their bid until the political and market uncertainty had cleared. Several weeks after hearing the news, Participant 3-0-1 still required SKCO complementary resources, in the form of signing a letter of support for BRCO's new product to receive grant funding from the UK technology Strategy board. However, Participant 3-0-1 was unable to contact customer representative at SKCO and all talks were put on hold. Figure 27 illustrates the relationship development timeline between BRCO and SKANCO.

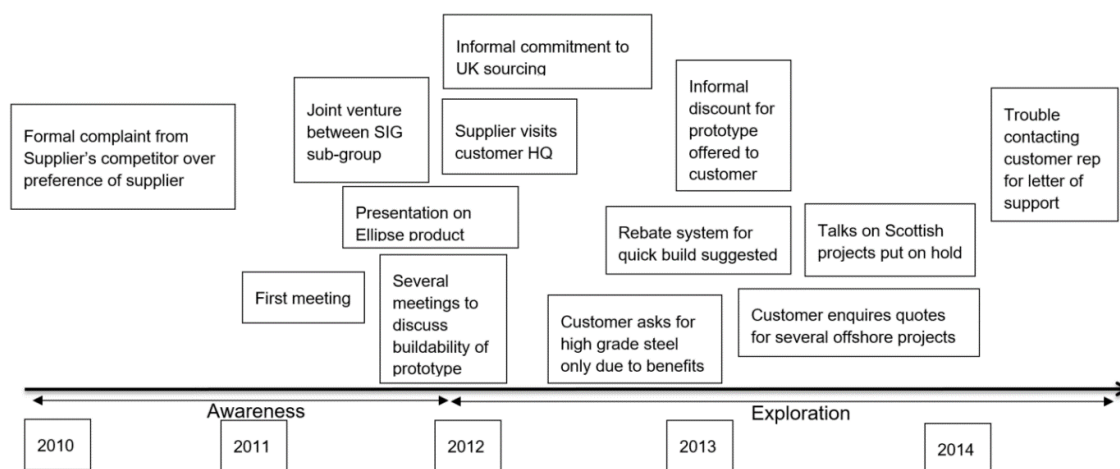


Figure 27 BRCO – SKANCO relationship development timeline

4.1.3.4 Case #3.4

This case analyses the relationship between BRCO (focal firm) a supplier to BAMCO, the customer. The case involves interview with the following participants: 3-0-1: BRCO OSW operations director; 3-1-2: BRCO Key account manager; 3-1-3: BRCO Technical product manager. Further details about the interviews can be found in Appendix 6.

BAMCO is one of the largest construction enterprises in Europe with experience and specialist knowledge in all aspects of civil engineering, building, and process. BAMCO had developed a prototype design for their CGF and was starting talks with several suppliers of steel bar to form cost information and develop a supply chain.

Awareness stage

BAMCO and BRCO first met in late 2012 at an offshore wind conference in Glasgow. This was followed up by a visit from BRCO personnel to BAMCO's office. From their arrival, BRCO personnel felt that the two companies did not share as much similar ground

as they expected. Their compatibility in terms of common goals, values, and ethics were noticeably different, as noted by BRCO staff who visited BAMCO offices: Participant 3-1-2: “When I walk into BAMCO’s office in Camberley, I doubt that they have all bought into it; I think there are still many employees who think, what is all this crap up around everywhere? Let’s put the football on ... I honestly think that these companies want their cake and want to eat it ... The sustainability and responsibility reasons are done for effect.”

This bothered BRCO personnel as they instantly felt distrust towards BAMCO as they felt that BAMCO were selling to their customers based on their sustainable credentials and UK content; however, they did not totally abide by what they said. This instantly brought about some incompatibilities between the two organizations but did not stop the relationship from continuing, Participant 3-0-1: “We will deal with them, but they just don’t have the same ethics as some of our other customers.” However, there were technological and process compatibilities between organizations as they were both using the BIM model to manage their construction operations. This would improve the supply chain and logistics of both parties’ operations if they were to conduct future business together. Participant 3-1-3: “It is a foregone conclusion that they will be using BIM.” BRCO delivered a presentation on their services and their new product for the offshore wind industry, and BAMCO discussed their current CGF design and the manufacturing and logistics processes that would be required from BRCO. BRCO suggested they would be able to improve BAMCO design if they allowed them to take it back to their designers to work on; however, BAMCO were not interested in the idea and refused. BRCO felt there was a serious lack of information sharing between the two that made the relationship difficult on a personal level. BRCO felt that any social bonding that should have taken place, had not, and felt that the two were not seeing eye-to-eye. This was emphasized again when BRCO suggested they could improve BAMCO’s CGF build time by building two or three CGF for BAMCO and then measuring the time taken in production to improve the production time for the next units. BAMCO were uninterested; Participant 3-0-1: “They treat us differently.”

Exploration stage

Several months passed with no contact from BAMCO, that BRCO found unusual. Then, BAMCO contacted BRCO and asked them to provide quotes for supplying steel bar to two offshore wind farms. When BRCO contacted BAMCO to explain and exchange

technical knowledge on the different types of steel products, grades, finishes, and bevelling available, an option was given to BAMCO to choose between two grades of steel. BRCO explained that the higher-grade steel, although more expensive than the lower grade, would not require as much for a CGF compared to the lower grade, and so it would be in BAMCO's best interest to choose the higher grade. BAMCO did not listen to BRCO's advice and chose to be quoted for the lower grade steel. Whilst communicating with BAMCO, BRCO found that their focus was on price with a short-term outlook on their supplier relationships, while on the other hand BRCO were more focused on building and developing a long-term relationship. Thus, there were obvious incompatibilities between the two organizations. These incompatibilities and the lack of communication between the two organizations started to build mistrust between the two companies and made it hard for both organizations and personnel to find common ground. BRCO started to question BAMCO's commitment to sustainability; Participant 3-0-1: "Some of these companies (BAMCO) are making all these statements for sustainability but they are probably breaking the law, as they don't abide by them."

During the time BRCO were delivering quotes to BAMCO's request, political uncertainties meant that the offshore wind farms being developed were put on hold; Participant 3-1-2: "We were up there talking to BAMCO who are working on the Beatrice Wind Farm in Northern Scotland, to provide concrete gravity bases, but all of a sudden, talks between us have stopped due to the political situation." Another surprising issue emerged when BRCO proposed that their new product could be used and tested along with BAMCO's prototype design. This was BRCO's way of introducing the idea of an integration initiative between the two companies, bringing them closer together with the aim of strengthening their relationship and developing a long-term partnership. BRCO needed a partner to help them apply for innovation grants and wanted BAMCO to join them to write a letter of recommendation to help certify their new offshore wind product. Unfortunately, BAMCO was not interested in this idea and preferred a more hands-off approach. BRCO's new product was a higher price than the standard steel bar product available because it was in the prototype stage of development; however, BRCO made concessions to BAMCO so it could offer the new product at the same price as standard steel bar; having BAMCO on board would speed up the development of their product, by providing letters of recommendation to funding boards, and by ordering enough to make the production, testing, and manufacturing costs feasible.

BRCO's new product would also provide further cost benefits to BAMCO regarding build time; however, BAMCO decided not to go ahead with BRCO's new product and asked for the standard steel bar product instead. This may have been down to the lack of confidence BAMCO had in BRCO's new product, as it had not yet passed prototype stage; however, BRCO assured BAMCO there would be no issues or risks and they would have their new product certified to the same standards as the standard bar available; however, they failed to gain the trust of BAMCO. As a result, BRCO did not receive a request for their new product and instead for standard steel bar. Participant 3-1-2 mentioned how he believed BAMCO as a company had changed: "I thought they were an innovative company ... but they came across a bit apprehensive." Quotes were provided but BRCO were not given any feedback and did not hear from BAMCO again until shortly after two Scottish offshore wind farms were given the green light by political leaders. BRCO then received a request from BAMCO to build an onshore fabrication unit where steel bar would be delivered, fabricated, and then entered the CGF manufacturing process, all on port-side. BAMCO required costings from BRCO to satisfy their customer, an offshore wind farm developer. The offshore wind site BAMCO was bidding to supply required 80 CGF, which amounted to 25,000-40,000 tonnes of steel bar per year.

According to BRCO, this amount was not enough to justify building onsite facility, as their current steel plant was producing 160,000 tonnes per year at a current capacity of 100,000 tonnes. BAMCO did not appreciate this. BRCO's director suggested instead that they would be able to tranship the steel bar from their existing fabrication yards to BAMCO's decided place of manufacture. However, BAMCO did not take keenly to this idea, and they did not want to listen to BRCO who tried to explain why it was not financially justifiable to set up an onshore facility. The communication was one-way; BRCO's key account manager (participant 3-1-3): "BAMCO seem to keep quite distant."

BRCO mentioned to BAMCO that an order for 50,000 tonnes of steel bar a year would justify setting up a new facility on site, as afterwards machinery and equipment could be moved to other facilities and the building sold. However, BAMCO could not commit to 50,000 per year and could not understand BRCO's view that 25,000 tonnes were not a big enough order. When discussing BAMCO's sourcing strategies for steel bar, regarding the political attention on UK content and industry pressures for sustainability and responsible sourcing, incompatibilities emerged between the two. BAMCO explained how they may decide to purchase 80% of the steel bar required for an offshore wind project from the UK, while the other 20% would be bought from China for BAMCO to

make higher margins from the lower prices charged. However, BRCO did not see this as a problem as they didn't expect to be a single source supplier, but did see it as a lack of commitment regarding a long-term relationship with BRCO. Participant 3-0-1: "BAMCO has a much shorter-term view compared to the other CGF providers ... The likes of BAMCO would say, 'Well, the Chinese rebar is £40 per tonne cheaper; we would go with BRCO for an extra £10 per tonne but any price higher and then it's a commercial decision to buy the cheapest.'"

When asked about what stage the relationship between BRCO and BAMCO was in, Participant 3-1-2 replied: "We are in a build-up / exploration stage ... They treat us as a supplier and not a partner ... A more traditional approach of a construction supply chain, hands-off approach is used in this relationship." When preparing their tender to the developers, BAMCO did not include the potential reductions in costs of around 10 % that could be achieved by using BRCO's new product, which BRCO were surprised to find out. After a period of silence between the two companies, BRCO contacted BAMCO to suggest they visit BAMCO's Scottish office to discuss Scottish wind projects; however, BAMCO stated that they were happy with BRCO and their products. Participant 3-0-1: "It was a case of we will call you and not the other way around." Participant 3-1-2: "This is disappointing but there's nothing we can do about it." Figure 28 illustrates the relationship development timeline between BRCO and BAMCO.

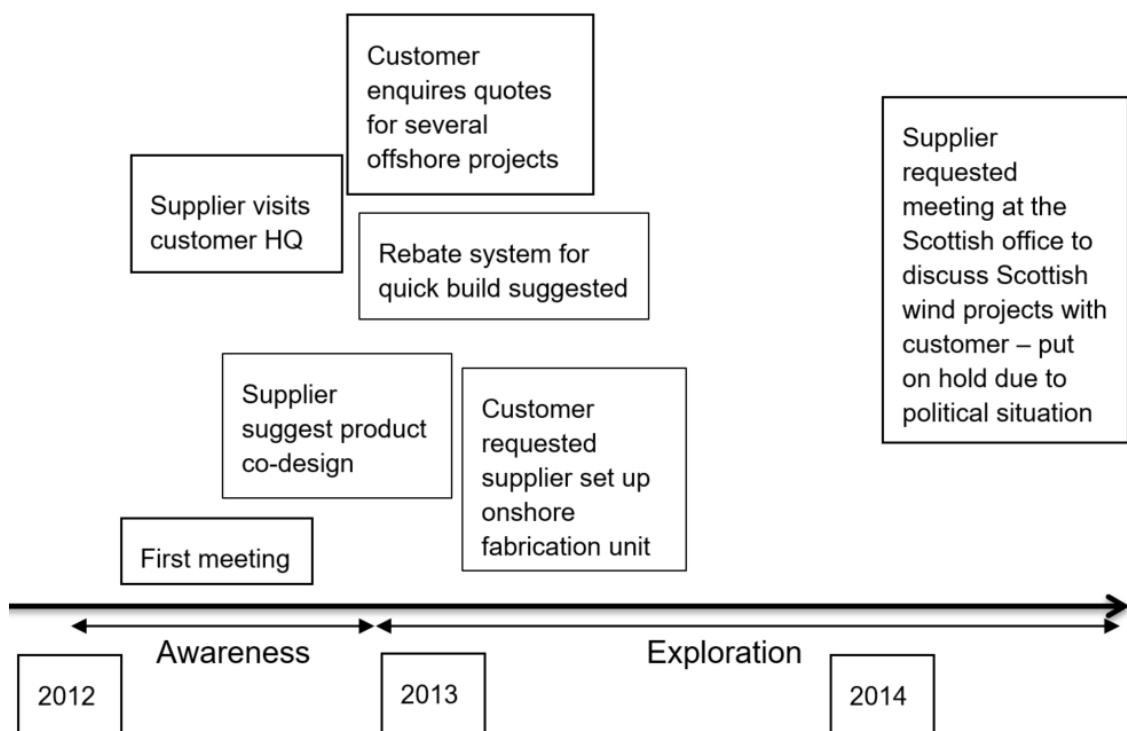


Figure 28 BRCO – BAMCO relationship development timeline

4.2 Cross Case Analysis

Having discussed each case describing how interfirm relationships have developed over time, it is necessary to examine the similarities and differences between the cases (Eisenhardt, 1989). The cross-case analysis focuses on the early stages of development, with particular emphasis on (1) the role of complementarity and compatibility in the forming of new interfirm relationships, and (2) the triggers and barriers for entering each relationship stage.

Figure 29 plots a timeline of the 12 pairs of relationship development trajectories. The figure displays variation among each of the cases; where some relationships took two years to explore, others spent up to six years in the exploration stage. There is variation among the cases, particularly when considering the level of market and political uncertainty; between cases with higher uncertainty, relationship development speeds were seen as erratic. Some cases bore the necessity to gain fast trust between buyer and supplier, whilst others depended on the outcome of political decisions in the market, which meant the relationship would be stalled in the expansion stage. Some relationships progressed to the expansion stage.

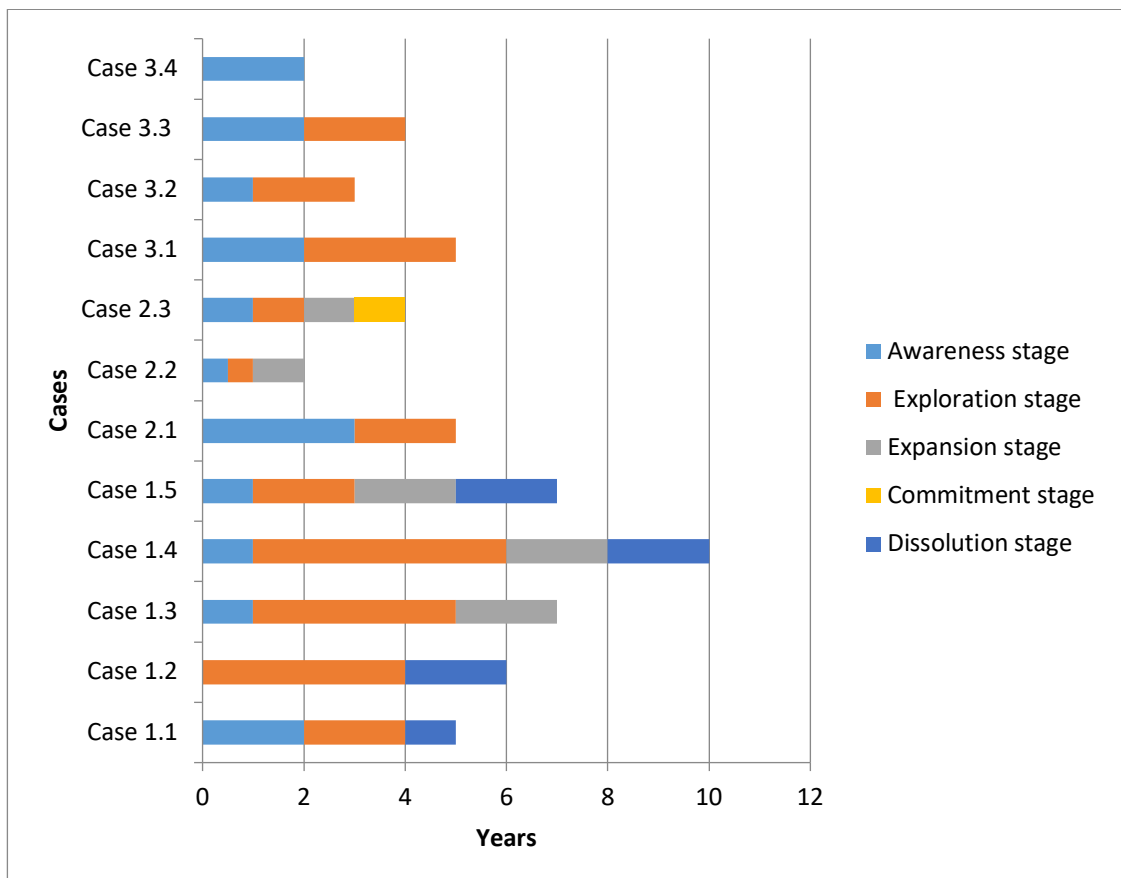


Figure 29 Relationship Development Trajectories

As explained in the research methodology chapter, the data was coded in order to identify patterns between the cases selected. Numerous tables in this chapter illustrate representative quotes taken from each of the cases for each relationship development stage to provide evidence for the findings of this research. Timelines were drawn for each relationship studied across the cases to describe the evolution of compatibility and complementarity, and identify triggers for each case. The cases share similarities in that each buyer or supplier studied is based in the UK.

For cases in the OSW sector, typically the relationships are newly formed due to the nascence of the industry; this has allowed the study to examine the key factors leading to the formation of new interfirm relationships. For each of the OSW cases, the relationships have been studied over a four-year period.

As outlined in chapter three, the cases were selected for their importance and contribution to UK manufacturing. The cases were purposively selected to as they illustrated the most variance between the cases, another reason for choosing the three focal companies was that the research had gained more in-depth access to the companies that would then report on their experiences with multiple partners enabling ore data to be collected and allowing for more rigorous assessment of relationship constructs and life-cycle stages. The analysis of the three focal companies was undertaken due to more data being available to the researcher.

The cases were selected for their range in relationship development with supply chain partners, where the nascent OSW sector would observe the initial formation of buyer–supplier relationships. The cases were selected to cover nascent industries, the 12 pairs of relationships are illustrated in Appendix 7.

4.2.1 Awareness stage

The initial stage of a buyer–supplier relationship is noted by Dwyer et al's. (1987: 15) model as the “awareness” stage and is defined as, “Party A’s recognition that party B is a feasible exchange partner”. Potential partners have yet to work together on a transactional basis. Suppliers and buyers rely on distinguishing themselves in the market through compatibilities with potential partners and complementary resources they can offer.

Compatibility

For cases that involved the start of a new relationship between buyer–supplier, it took suppliers who were looking for new customers a lot longer to convince the customer to work with them. This required **regular visits** to customers to communicate their offering as well as build social bonds between staff at the organisation. On the other hand, for the cases that involved buyer and supplier who **had previously done business together** in other industries, the investment required by buyer or supplier was a lot less compared to the new relationships. For example, the suppliers in Cases 1.1, 2.2, 3.1, and 3.2 talked to new suppliers, made multiple visits, and arranged numerous meetings with several potential customers in order to explain the benefits they could offer as supplier. However, the supplier in Case 2.3 skipped past the first stages of relationship formation due to previous working relationships built upon projects undertaken together in the past.

While the cases studied from the buyer’s perspective saw an equal amount of **effort invested** into starting relationships with new suppliers compared to existing suppliers, the relationships initiated from scratch typically spent more time in the awareness stage, where partners were **assessing the level of compatibility** in values and goals, as well as the complementarity resources and capabilities partners could offer by working together in the future. For the OSW cases, the suppliers were seen to invest more effort and resources to increase compatibility with new management of the buyer company and to **establish trust** between individuals on a personal level. For the supplier cases (cases 2.2, 2.3), the suppliers, who shared **similar values** with their customers in terms of sustainability and responsible sourcing, built trust faster than the suppliers’ relationships with customers who did not share these values and tended to be driven primarily on price. Thus, for the cases that were more relational in nature as compared to transactional, higher levels of trust resulted (Martins et al. 2018).

In the awareness stage the social bonds between staff at the buyer–supplier firms were a key factor in developing the relationship to further stages. Social bonds enabled the staff to **communicate** regularly and offset any uncertainty with their partners on their plans for working together in the future. These personal ties enabled the supplier to prevent initial trust loss by the buyer and proved vital for relationships progressing through the awareness stage (Kaufmann et al. 2018) It was also key for suppliers hoping to win new business to actively contact potential customers to explain their company values and goal to identify the best match for a partner. Having strong **social bonds** in place enabled the

buyer–supplier firms to gain a clear idea of how they planned to work together in the future.

In all the cases, communication between buyer–supplier during the awareness stage was vital to removing uncertainty and establishing compatibility between each other. For the cases in the OSW sector, communication was fundamental to reducing the **uncertainty** faced from political decisions in the market, and also to establish whether the firms shared the same values in terms of sustainability and responsible sourcing. Communication also enabled the buyers in cases 2.1, 3.2, 3.3 and 1.2 to ascertain whether their potential suppliers shared their vision of producing high quality products.

Communication in all the cases allowed the potential partners to discuss how their **work routines** would coincide, should they move into a deeper relationship together. Communication also allowed each partner to mitigate cultural incompatibilities that existed; for example, the geographic distance between buyers and their suppliers in Cases 1.1, 1.2, 1.5 and 2.2 highlighted the vast cultural differences in work routines and operating practices which then required more investment in time and communication to overcome. For the cases involving partners who were **distant from each other geographically and culturally**, much more idiosyncratic time and financial investments were required to establish the feasibility for working together; for example, case 1.1 involved the supplier sending multiple staff on numerous long-haul flights to the customer to increase the level of compatibility with its potential customer, while in cases 1.3, 1.4 and 1.5 the customer made regular visits locally to their suppliers to assess the level of compatibility in values and work routines.

During the awareness stage, it was observed that in some industries there was growing interest in **local sourcing**, not only pushed on by institutional pressures but also the values of the specific suppliers or buyers studied (cases 1.1, 2.2, 2.3, 3.1). The emphasis on sustainability in terms of local content helped align common goals of potential partners and their associated supply chains; Case 1.1, Participant 1-1-2: “UK content is becoming a hot potato now; our prospective customers are requiring us to provide a list of all components we source from the UK ... Consequently, we were selling the UK, showing them the UK should be their manufacturing location rather than another country”. The market and institutional needs for **sustainability** helped the focal companies quickly realise whether their potential partner shared the **same values**, and instantly identified incompatibilities between potential partners. This would also give the focal supplier or

buyer a clue about whether their potential partner was likely to form a long-term partnership (cases 2.2, 2.3, and 3.1), or treat the relationship as purely transactional and short-term (cases 2.1, 3.5, 1.5); Case 2.2, Participant 2-0-1: “It’s important for a supplier to understand what type of relationship the customer wants; I think through time, relationships are changing particularly because of market circumstances. I think relationships are different compared to what they used to be like; buyers are thinking differently compared to in the past.”

The case analysis also found that when **personal relationships** between staff at partner firms were close, there would be more **informal commitments** made to working together in the future. The cases exhibiting strong personal relationships could be attributed to the proximity of the buyer–supplier firms, where closer proximity meant that cultures were more closely aligned; for example, firms that were **closer in proximity to their customers** would tend to be more open with information sharing and develop informal working practices together. This helped build trust at a much faster rate compared to, for example, case 2.1, where the vast distance between supplier and buyer made communication and **information sharing** more difficult, and thus the process of building trust between the firms took longer. For some of the cases where the buyer–supplier relationship had pre-existing ties from work or dealings together in other industries, the personal relationships between staff were close; this meant that these relationships would typically spend less time in the awareness stage. For all cases, the level of **compatibility** between the partners was very important in the awareness stage, as it enabled the partners to build a foundation for commitment and cooperation to grow in later stages of the relationship.

For the three cases studying the buyers’ search for feasible suppliers, compatibility with the suppliers’ work processes and **values of quality** were of utmost importance. To meet the stringent quality standards required by the OSW, establishing compatibilities with the supplier was a key factor for the progression of the relationship to the next stage. For case 1.2, 1.3, 1.4 and 1.5 assessing the level of compatibility with a potential supplier was a costly affair. It involved regular visits by staff on various levels of each organisation, and on-going regular discussions for the buyer to build trust in the supplier’s capabilities. Table 5 below outlines the key compatibility factors across the three focal companies.

Awareness Stage – Compatibility		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Distant buyer, vast cultural differences (CU)	Some European similarities in culture (CU)	Sustainability and responsible sourcing values shared with most buyers (VA)
Vast geographic distance (CU)	Strong values in UK manufacturing sometimes matching with customers (VA)	Cultural similarities, UK staff from both firm (CU)
Values differed at the start based on expectation but were realised (VA)	Suppliers processes were incompatible (PS)	Supplier steel market knowledge (M)
Supplier offered tailored product (P)	Suppliers product did not meet customer quality standards (P)	Social Bonding (PR)
Vast differences in work routines with buyer (WR)	Investment in networking, new relationship development (PR)	Developing relation-specific routines (WR)
Supplier differences in values and quality expectations (VA)	Identifying common ground (WR)	Identifying common goals (WR)
Despite some suppliers being UK based, cultural differences arose (CU)	Relation-specific routines (PS)	Close geographic distance (CU)
	Communication (WR)	

CU, Culture; VA, Values; PR, Personal Relationships, WR, Work Routines, Product (P), Process (PS)

Table 5 Compatibility in the awareness stage

The case analysis found that suppliers who were geographically further away from their customers took longer to gain their trust and establish common ground. The cases illustrated the crucial need for a supplier wanting to win business from a customer, needing to understand their customer’s “way of doing business”. Many cases showed how a supplier, who would not consider the cultural background of their customer in enough detail, would often spend a lot more time and effort. A recurring factor observed in some of the supplier cases, that prevented the relationship progressing to the expansion stage, was the buyer’s sole focus to **purchase based on cost**. Despite previously working together and building trust and common working procedures together, the focus on cost would still prevent relationships from progressing further. For example, in Cases 2.2, 3.1, and 3.2, there was a history of personal relationships that built compatibility between the two organisations; nevertheless, in some cases, the buyer did not respond mutually and considered alternative suppliers, due to being unhappy with the quality despite the supplier’s investments to deliver per the buyer’s standards and expectations. Figure 30 below illustrates the variance in compatibility between the 12 pairs of relationships during the awareness stage.

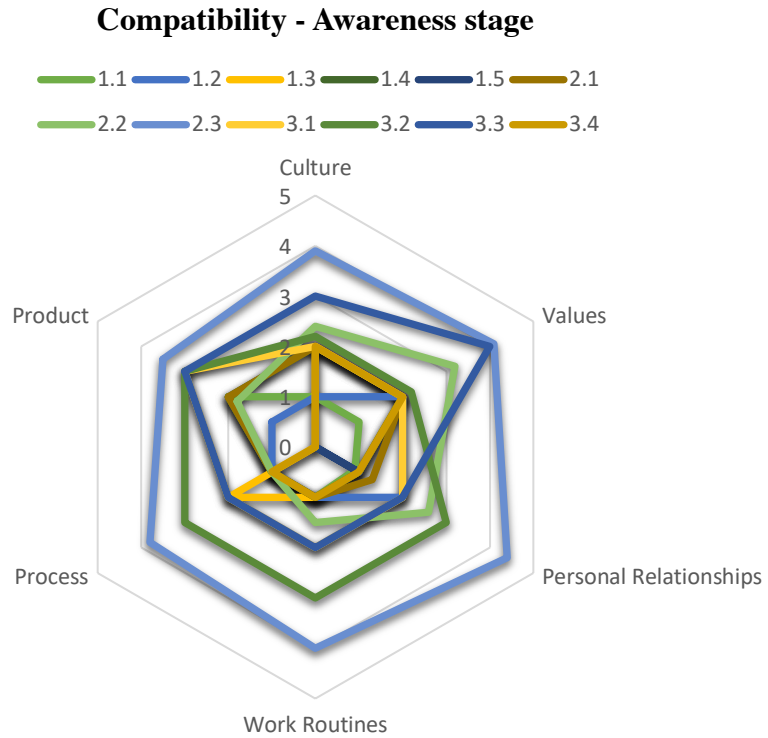


Figure 30 Compatibility in the awareness stage

The radar plot above displays the scoring of each element of compatibility, scored by the researcher and validated by the participant. The lines around the outer edge of the radar plot represent high scores (i.e. up to a maximum of five out of five), while the lines towards the middle of the radar plot represent lower scores (i.e. down to a minimum of zero out of five). Table 6 below attempts to combine and synthesise the findings from the radar plot, illustrating the scoring on each element of compatibility (i.e. culture, values, personal relationships, work routines, process, product).

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Culture	1	1	2	2	0	2	2.4	3.9	2	2.2	3	2
Values	1	2	2	2	0	2	3.2	4.1	2	2.2	4	2
Personal relationships	0.9	2	1	1	1	1.3	2.6	4.4	2	3	2	1
Work routines	1	1	1	1	0	1	1.5	4	2	3	2	1
Process	1	1	2	1	0	1	1	3.8	2	3	2	1
Product	2	1	0	2	0	2	1.8	3.5	3	3	3	0

Table 6 Awareness stage compatibility scores

The significance of each element of compatibility was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 7 below. This scoring system is used for each relationship stage to follow in this thesis.

	Compatibility scoring and significance				
	1	2	3	4	5
Culture	Comp. in cultures is very low	Comp. in cultures is low	Comp. in cultures is medium	Comp. in cultures is high	Comp. in cultures is very high
Values	Comp. in values is very low	Comp. in values is low	Comp. in values is medium	Comp. in values is high	Comp. in values is very high
Personal relationships	Comp. in personal relationships is very low	Comp. in personal relationships is low	Comp. in personal relationships is medium	Comp. in personal relationships is high	Comp. in personal relationships is very high
Work routines	Comp. in work routines is very low	Comp. in work routines is low	Comp. in work routines is medium	Comp. in work routines is high	Comp. in work routines is very high
Process	Comp. in process is very low	Comp. in process is low	Comp. in process is medium	Comp. in process is high	Comp. in process is very high
Product	Comp. in product is very low	Comp. in product is low	Comp. in product is medium	Comp. in product is high	Comp. in product is very high

Table 7 Compatibility scoring and significance

Complementarity

Complementary resources allow firms to combine acquired resources with their own resource sets, thereby creating a **resource bundle** that provides unique and difficult-to-imitate value (Harrison et al. 1991). For the cases studying suppliers entering the OSW sector and finding potential partners, the ability to offer complementary resources to potential partner was of utmost importance. The OSW suppliers would invest heavily in their **product and process** capabilities even before receiving an order from a potential customer. For example, Case 3.1 saw the supplier investing in a new product specifically designed for the OSW sector, which would help them reduce build time costs and provide them with an edge over their competitors offering products that already existed in the OSW market.

For the OSW sector cases that faced high levels of **uncertainty**, a key factor in speeding up relationship development was the supplier's **complementary knowledge of the market**, this would help the customer **remove some uncertainties and risks** in moving to the next stage and forming a deeper relationship. The focal suppliers working in the OSW sector had made significant investments prior to starting relationships with their customers. The suppliers in these cases were entering the OSW sector for the first time and had no previous experience supplying to the sector, insofar as all three suppliers had to make investments to build on their complementary resources and make themselves be

seen as a feasible partner to supply to the OSW sector. Another interesting finding is for cases 1.1, 2.2, 2.3, 3.1 and 3.3 where the suppliers faced strong competition from overseas that were focused on a price perspective. The suppliers were not able to compete on price and so had to strengthen their argument as to why their **complementary products, processes, or technology** were more beneficial for their customers in the long run. We also see that firms will make investments to increase product and process complementary; for example, cases 2.1, 2.2, and 2.3 saw the supplier investing in a dedicated wind tower hub that would offer state of the art supply chain solutions tailored to the OSW sector; the investment was made prior to receiving any orders from a customer. In all supplier cases, the suppliers would offer the buyer complementarities by **investing in new product development**, as well as technology required to satisfy the buyers requirements. They would also make sufficient sacrifices to please the buyer and show their commitment to the relationship. Suppliers who had trust in the buyer tended to share more information and initiate more joint problem-solving activities that led to the development of new products and services helping the partnership gain sustainable competitive advantages (Mai Anh et al. 2018).

For the awareness stage in particular, it was observed that focal suppliers hoping to win orders from a potential partner would **invest a lot of time and money** to demonstrate their ability to transfer technical expertise and product and process knowledge, as well as market knowledge with their buyer, should they be chosen as a supplier; Case 2.2, Participant 2-1-2: “I have engaged a guy in what’s called ‘customer technical services’ (WTCO), who is an advisory engineer, and I have said, if you need any more in-depth technical knowledge, we have the resources at TACO to help you.”

While Cases 1.1, 2.1, 2.2, 2.3, 3.1 and 3.3 posited that the suppliers would make vast financial and time investments into proving to the customer that they were a feasible supplier, this was also the case for the buyers, who would also need to undertake various investments in assessing and ensuring that the supplier could deliver on what was proposed. **Complementary** resources in the form of technical knowledge were found to be very important in the awareness stage, particularly for suppliers, where for example, Case 3.1-3.4, illustrated how the supplier’s **technical knowledge** helped re-design the customer’s product, saving the time and money in the manufacturing process. This built the trust of the customer and identified what value the supplier would offer in the relationship.

Reputation was a key factor when deciding on embarking on a new interfirm relationship. For the OSW supplier cases, due to the nascence of the industry, the suppliers had not been able to build a reputation based on the products they could offer to the OSW sector; however, their reputation based on their market/technical knowledge offered complementarities to potential customers, where for example, in Case 1.1, the supplier's reputation, knowledge, and contacts with government organisations helped them build the trust of their customer and be seen as a feasible supplier, whilst Case 3.2 and 3.3 offered complementary technical and **market knowledge** in the steel sector that the customer did not have and reduced a lot of uncertainty for the customer. Table 8 outlines the complementarities found in the awareness stage.

Awareness Stage – Complementarity		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
MOCO reputation in the UK market and contacts helped buyer (M)	Buyer shared market information and increased supply chain visibility to TACO (M)	Supplier sustainable sourcing (P)
Buyer had strong reputation in other industries (R)	Supplier close to market (P)	Supplier offered product and technological expertise to buyers (P, TE)
Supplier provided IP, technical knowledge on product and process (P, PS)	Supplier provided technical expertise on supply chain processes (TE, PS)	Supplier offered home market knowledge to buyer (M)
Suppliers offered buyer technology (T) product and process expertise (T, PS, P)	Knowledge sharing with buyer (TE)	Investment in market awareness of technical knowledge to potential partners (TE, M)
Buyer transferred capabilities in product and technology (P, T)	Buyer provided strong reputation in the OSW sector (R)	Search for technical knowledge complementarities in partners (T, TE)
Knowledge sharing with buyer (TE)	Information exchange (P, T)	Investment in awareness of technological offerings (T)
Investments in specify industry technology investments made by supplier (T, P)	Search for technological complementarities (T)	

Tangible (P, Product; T, Technology; PS, Process) Intangible (M, Market knowledge; TE, Technical expertise; R: Reputation.)

Table 8 Complementarity in the Awareness stage

Reputation in the market was a key factor for forming a relationship, especially for the OSW sector where for example, Case 2 supplier had 10 years' experience in the OSW, whilst their potential customer had no experience, which gave the supplier an advantage over their competitors and illustrated how their customer would benefit from **technical knowledge transfer** if they were to progress the relationship to the next stage. Further,

Cases 1 and 3 demonstrated how a supplier's reputation and **knowledge of the market** made them a very attractive partner to work with as they would be able to complement their suppliers with their knowledge of the market. In Case 1, the focal supplier had a strong reputation in the industry alongside complementary technical knowledge on products and processes, which made them a very attractive partner for potential overseas customers, as a longer-term relationship would ensure that this knowledge was transferred to the customer and would develop their capabilities to better serve the industry and win new business from their customers (the OSW OEMs) in the future. Buyers or suppliers who had a reputation for technical, product, or process complementarities typically spent less time in the awareness stage, whereas firms that did not have a reputation in the industry had to spend **more time communicating** these complementary resources with their prospective customer or supplier to progress to the next stage. Figure 31 below illustrates the observed complementarities in the awareness stage while

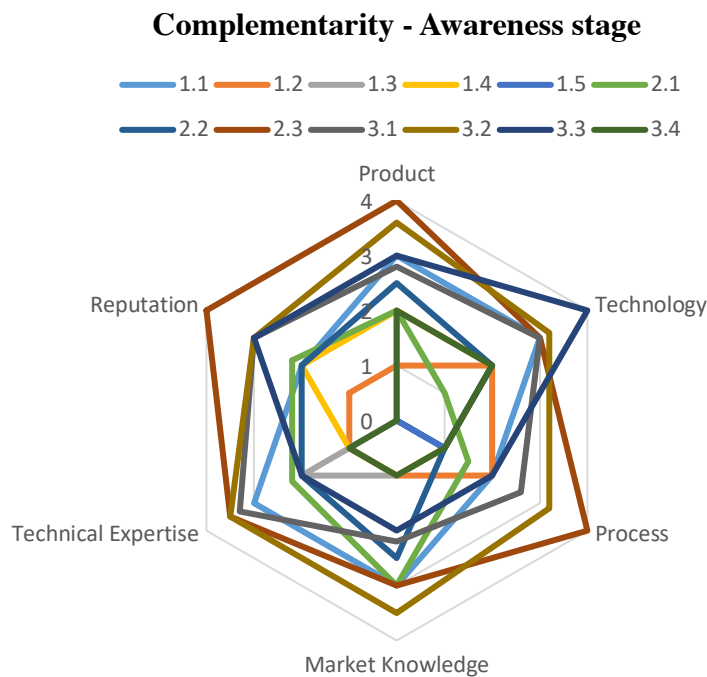


Figure 21 Complementarity in the awareness stage

Table 9 below attempts to combine and synthesise the findings from the radar plot, illustrating the scoring on each element of complementarity (i.e. Product, technology, process, market knowledge, technical expertise, reputation).

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Product	3	1	2	2	0	2	2.5	4	2.8	3.6	3	2
Technology	3	2	2	2	0	1	2	3	3	3.2	4	2
Process	2	2	1	1	1	1.5	1	4	2.6	3.2	2	1
Market Knowledge	3	1	1	1	0	3	2.5	3	2.2	3.5	2	1
Technical Expertise	3	1	2	1	0	2.2	2	3.5	3.3	3.5	2	1
Reputation	2	1	0	2	0	2.2	2	4	3	3	3	0

Table 9 Awareness stage complementarity scores

The significance of each element of complementarity was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 10 below. This scoring system is used for each relationship stage to follow in this thesis.

	Complementarity scoring and significance				
	1	2	3	4	5
Product	Comp. in product is very low	Comp. in product is low	Comp. in product is medium	Comp. in product is high	Comp. in product is very high
Technology	Comp. in technology is very low	Comp. in technology is low	Comp. in technology is medium	Comp. in technology is high	Comp. in technology is very high
Process	Comp. in process is very low	Comp. in process is low	Comp. in process is medium	Comp. in process is high	Comp. in process is very high
Market knowledge	Comp. in market knowledge is very low	Comp. in market knowledge is low	Comp. in market knowledge is medium	Comp. in market knowledge is high	Comp. in market knowledge is very high
Technical Expertise	Comp. in technical expertise is very low	Comp. in technical expertise is low	Comp. in technical expertise is medium	Comp. in technical expertise is high	Comp. in technical expertise is very high
Reputation	Comp. in reputation is very low	Comp. in reputation is low	Comp. in reputation is medium	Comp. in reputation is high	Comp. in reputation is very high

Table 10 Complementarity scoring and significance

The case studies showed that the relationships that moved fastest through the awareness stage involved high levels of complementarity, where partners were keen to access the others' resources to develop their own capabilities. For example, Case 2 illustrated how a supplier, who was new to the OSW sector, saw it of utmost importance to develop a relationship with a leading OSW company with a strong reputation in the market, that would help the supplier enter the OSW market by **sharing their technical and market knowledge** and boosting the supplier's reputation by making them a strategic partner. This was also a similar situation for Case 1.1, where the buyer saw that the potential

supplier could offer complementary resources in terms of their reputation in product innovation and design, and also their reputation and knowledge of the OSW market.

4.2.2 Exploration stage

The exploration phase is a search and trial phase in which the potential obligations, benefits, and burdens of continued exchange are considered (Jap, 2000; Brickman et al. 1987; Eidelson 1980; Holmes 1991). Uncertainty reduction and an assessment of the potential value of continued interactions are central goals in this phase (Jap, 2000; Berger and Bradac 1982; Berger and Calabrese 1975; Kent et al. 1981). To progress the relationship from awareness to exploration stage, the partners make an assessment on the traditional performance dimensions such as cost, flexibility, delivery, and quality of the products and services offered, and the levels of compatibility and complementarity between each firm. When entering the exploration stage, the buyer and supplier both start working together on a transactional basis. The exploration stage involves trial purchases to test and evaluate a partner's capabilities that help to build trust and joint satisfaction in the relationship.

For the cases that involved new partnerships as opposed to forming relationships with previous ties, the exploration stage typically took a lot longer to progress through. The study found that new interfirm relationships required more time working together on a transactional basis, as they needed to assess the complementary resources the partner could offer in the relationship, such as product innovation or reputation for trustworthiness and performance. The partners with no **pre-existing ties** would also need more **time to develop** compatibility in the relationship through **social bonding**, and **communication** to help remove uncertainties between the two partners. This was particularly evident in Case 1.1, where both partners were totally new to each other, had differing cultural values which required increased communication and social bonding in order to increase compatibility between the two firms. Whilst, partners with pre-existing ties working in same industry or different industries found it a lot easier and quicker to assess each other in terms of their compatibility with one another, their performance, and the complementary resources they could bring to the relationship.

During the exploration stage, **reducing uncertainty** was a key factor in many of the cases; to do so, suppliers would value the market information from their suppliers who would be involved in lower supply chain tiers. The ability of partners to share market knowledge with one another provided crucial in building trust and showing long-term

commitment to the relationship; Case 2.3, Participant 2-3-2: “It is a fairly open relationship in terms of project pipeline; they keep us informed about what projects are breaking.” Differences were apparent in the OSW cases where there was much higher political and market uncertainty. In these cases, the partners would work much more intensely together to minimise the risks of external uncertainties; this required high levels of compatibility through personal relationships, to aid regular two-way communication between the firms, and also develop joint work routines and align company cultures to provide the foundation for a longer-term relationship. In particular, it is observed that partners working on product innovations/ improvements helped transition the relationship towards the exploration stage. Furthermore, for some cases the compatibility in culture, values and relationships on a personal level helped trigger the exploration stage.

Compatibility

In the exploration stage, communication increases and staff from both partners will start to develop work routines. For the cases that had partners in close geographic proximity, there were many cultural similarities. This made communication straightforward and allowed the partners to **develop work routines** quickly, whilst for partners with geographic distance, cultures differed significantly. Incompatibilities arose in communication, establishing work routines, and general cultural difference and practices. For example, Case 1.1 illustrates how the buyer and supplier had very different cultures and entered the exploration stage with a high level of incompatibilities, where **cultural differences** resulted in misinterpretations between partners; Case 1.1, Participant 1-1-2: “They expect answers instantly; whenever they send an email, it has a deadline date for when we have to reply to them ... it is always a few days away, if not tomorrow.” Further, the geographic distance meant that language and time difference was a major factor in the difficulty in communication; Case 1.1, Participant 1-1-3: “They are a difficult customer; they want things right; their expectations of us doing things quickly were very high; for instance, ‘Can you be at a meeting tomorrow? ... Can you get this report to us tomorrow?’”

The focus on sustainability, from the supplier and buyer perspectives, proved to be a significant factor in the compatibility of partners during the exploration stage, particularly for UK based companies. For cases involving UK suppliers, incompatibilities would often arise in regard to sustainability, where suppliers accepted that customers **would treat them as a supplier rather than a partner**; Case 3.4, Participant 3-4-1: “I honestly think

that these companies want their cake and want to eat it”, “the sustainability and responsibility reasons are done for effect.”

The cases that involved **close personal relationships** between staff at each firm allowed the firms to work together on an informal and flexible basis. A high level of trust in most cases was already established, which made communication and information sharing effective and two-way throughout multiple levels of partner firms (Mohr et al., 1996). Personal relationships also enabled partners to experiment with new ideas and **introduce joint initiatives** to meet common goals (Mohr and Nevin, 1990). The closeness of personal relationships also enabled suppliers to make their customers take on further risk in the relationship, which would be mutually beneficial in the end. Personal relationships fostered by the suppliers enabled them to negotiate well with the customer, particularly for the OSW industry UK-based firms faced tough competition from overseas suppliers with lower prices; however, personal relationships between key decision makers were seen to be crucial for suppliers getting future orders and growing the relationship. For example, in Case 3.2, facing cut-price competition from China, there were tough negotiations on getting the customer to **commit to long-term partnership**; a goodwill gesture of a reduction in price, despite the extremely low margins, was enough to prove their commitment and helped build trust with the buyer.

The personal relationships within the OSW sector proved vital for some companies to gain approvals and written consents from partners, to receive funding from Government bodies to improve their product and **technological capabilities**. Case observations showed that partners with similar characteristics built up relational capital much faster and could develop relational capital that positively affected that outcome of a partnership. **Relational capital** strengthened mutual trust and enabled partners to weather through uncertainties in the market. As observed in most of the cases, through **mutual trust** came mutual commitment and information exchange that moved the relationship from an arm’s length exchange to a more relationship-based arrangement. In cases where information and knowledge exchange were two-way both organisations improved their supply chain performance and developed product and process innovations (Zacharia et al. 2019). Thus, in all of the cases, it is observed that the importance of individuals in building relational capital is paramount, where their ongoing efforts to build and maintain the exchange can yield tremendous value and customer satisfaction (Jap and Anderson, 2001; Cravens, 1995; Wortruba, 1991).

For the cases where partners were geographically distant (Cases 1.1 and 1.2), it was very costly and time-consuming to establish efficient work routines among staff. Regular visits by staff from both partners took place and required significant investment by each organisation. Relationships that involved staff exchanges typically facilitated **knowledge exchange** of either technical or product knowledge from the other partner. For the supplier cases, suppliers with product or technical expertise would be able to transfer capabilities with the intent to build trust and secure long-term business with the customers (Ganesan, 1994). The **transfer of capabilities** from supplier to buyer was crucial for the supplier's future business and relationship development. Where suppliers could not offer product or technical expertise, they would rely on market reputation as well as knowledge of the market due to their long-standing history.

It is observed that incompatibility between partners led to a counterproductive working relationship with **conflict and distrust**. For cases where cultural compatibilities were high between top managers, trust tended to be higher which resulted in more types of cooperation when top managers approached a conflict situation with one another (Holtgrave et al. 2019). In some cases, the focal buyer or supplier made investments in time and money to reduce incompatibilities in the relationship. A lot of time would be invested in **communicating regularly** with the partner company, which would require staff exchanges and regular meetings between top level staff as well as lower levels. Where suppliers were dependent on their buyer, there was greater a chance they would invest in reducing incompatibilities, even when the incompatibilities were so vast. When the focal company was a sole supplier or buyer, and incompatibilities between culture, values, and work routines were vast, they would invest limited time and money to reduce these incompatibilities and would typically operate at arm's length with their partner (Cases 1.4, 1.5, 2.1 and 3.4). Table 11 outlines the compatibilities found in the exploration stage.

Exploration stage – Compatibility		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Distant buyer, vast cultural differences (CU)	European, distant suppliers, some differences in European cultures, formalities (CU)	Sustainability and responsible sourcing values shared with most buyers (VA)
Values differed at the start based on expectation but were realised and strengthened relationship (VA)	Work routines were established and developed (CU)	Cultural similarities, UK staff from both firms (CU)
Despite some suppliers being UK based, cultural differences arose (CU)	Information Exchange (PS)	Personal relationship/ social bonding (PR)
Strong bonds between staff at executive and management level developed over time (PR)	Social bonding (PR)	Willingness to adapt to cultural expectations (CU)
Differences in values and quality expectations of suppliers (VA)	Shared values (VA)	Willingness to take small risks (VA)
		Compatibility of shared goals (VA, WR)

CU, Culture; VA, Values; PR, Personal Relationships, WR, Work Routines, Product (P), Process (PS)

Table 11 Compatibility in the exploration stage

Evidence of relationships stalling in the expansion stage were due to the lack of business, or projects the focal company would be awarded. For the all cases this was particularly common, where high uncertainty in the market resulted in a lack of transparency across the supply chain and led to work being awarded on an ad hoc basis rather than on-going. The negative side of trust was found to be more pronounced when there was high uncertainty on the supplier's side, unlike the results stated by Villena et al's. (2019) study. This made it harder for partners to work together and **build up common work routines** whilst working on projects, as well as develop personal relationships between staff members to overcome incompatibilities. High uncertainty resulted from the need to reduce cost by sourcing products overseas, there was also significant uncertainty owing to the internal restructuring of the buyer. Therefore, the suppliers found it very difficult to establish common ground and working practices with the buyer. It was observed that cases exhibiting high levels of incompatibility in values, norms, and culture tended to result in higher levels of stress when trying to reduce uncertainty in the relationship (Cases 3.4). Figure 32 illustrates the compatibilities in the exploration stage.

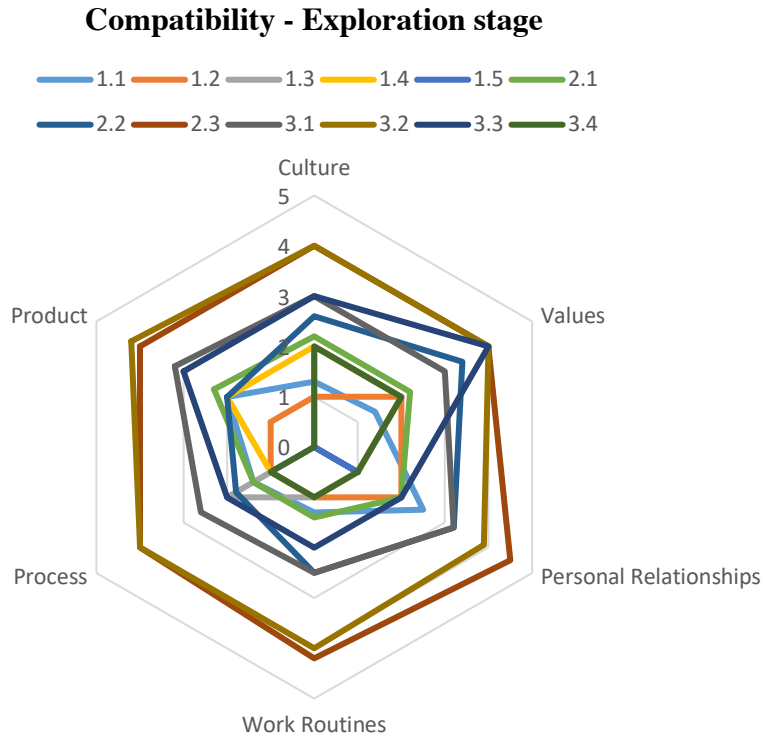


Figure 32 Compatibility in the exploration stage

The significance of each element of compatibility was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 12 below. This scoring system is used for each relationship stage to follow in this thesis.

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Culture	1.3	1	2	2	0	2.2	2.6	4	3	4	3	2
Values	1.4	2	2	2	0	2.2	3.4	4	3	4	4	2
Personal Relationships	2.5	2	1	1	1	2	3.2	4.5	3.2	3.9	2	1
Work Routines	1.3	1	1	1	0	1.4	2.5	4.2	2.5	4	2	1
Process	1.4	1	2	1	0	1.4	1.8	4	2.6	4	2	1
Product	2	1	0	2	0	2.3	2	4	3.2	4.2	3	0

Table 12 Exploration stage compatibility scores

Complementarity

During the exploration stage, partners would initiate small joint projects together to assess the performance of their counterparts. For example, in Case 1.1, the supplier wanted to demonstrate their strong product and **technical capabilities** to their customer and did so by inviting the customer’s design staff to their factory for several months at a time to train them.

During the exploration stage, the partners experienced their perceived benefits of pooling resources and capabilities. Through the interaction and integration of each partner's resource base, **relationships were triggered** to move towards the expansion stage when the relationship moved from being market based toward a mutually orientated collaborative relationship (Cases 2.1, 2.2, 2.3, 3.1, and 3.2). This involved a high exchange of complementary resources, including technical knowledge such as quality standards required and market information, and also offering product technology to help **improve their partners' manufacturing systems and processes** to progress faster through the exploration stage. However, despite high levels of complementary resources offered by exchange partners, some relationships did not progress as fast as others through the exploration stage, which was due to their vast incompatibilities with each other (Case 1.1 and 3.4).

Where there were **mutual technological complementarities** such as supply chain innovations enabling JIT delivery (Cases 2.3 and 3.2), new process innovations (Cases 1.1, 2.2, and 3.1) and technology products to improve the **quality standards** in partners' manufacturing processes (Cases 1.2, 2.1 and 3.2), relationship quality would be stronger and partners would be more open to one another, resulting in higher levels of trust and building on mutual commitment (Michalski et al. 2019). In all the three aforementioned cases, the investments in relationship specific resources and high levels of technical knowledge exchange helped the partners develop joint quality initiatives that led to greater performance of the partnerships. For case companies operating in highly uncertain market conditions, the exploration stage involved **building trust** through **sharing market information** with partners, with the aim of reducing uncertainty and facilitating the potential for new orders (Cases 1.1, 2.2, 2.3, 3.1, and 3.2).

During the exploration stage, partners would be involved in an exchange, typically seen as a trial purchase, where partners would evaluate each other's capabilities in order to build trust and satisfy expectations of one another (Dwyer et al., 1987). For the supplier cases, there were high expectations on the need to deliver to expectations set out on the awareness stage of the relationship. Once in the exploration stage, it was observed for all cases that partners would **trial and test** one another on expected deliverables. For example, in Case 1.1, the supplier was required to introduce the buyer to all the government contacts required to gain planning permission for a prototype test site. For Case 2.2, this involved the supplier inviting the buyer to their facility for an inspection, in order to demonstrate sufficient capabilities to carry out future projects. For the cases

from the buyer's perspective, the exploration stage involved visits to the supplier's facilities to undergo inspections to ensure that the suppliers could deliver to specific quality requirements (Cases 2.1, 2.2, 2.3, 3.1, 3.2, 3.4). Key criteria in the exploration stage was to ensure that specific suppliers could deliver to the requirements of the buyer before **committing to a long-term relationship**. For cases involving new relationships, i.e. the buyer and supplier were strangers with no previous ties, it was observed that the exploration stage was far more time and capital intensive than for cases with buyers and suppliers who had previous ties and experience working. Communication between the partners was a lot more intense than in the awareness stage; this involved regular meetings and coordination between staff of both partner organisations (Cases 1.1, 2.1, 2.2, 3.2, 3.3).

During the exploration stage, suppliers and buyers would undertake small joint projects together to test the competences of their partner. In some cases, the projects would not be completely successful; in other cases, the **high political and market uncertainty** meant that projects could not be taken further until the uncertainty had cleared and so relationships would tend to stall. According to DSO theory, these relationships would be abandoned because they were a liability, and difficult to revive and make profitable. However, this study found that this was not necessarily true. It was observed that, for cases where joint initiatives failed the first time around, partners would follow RV theory, where there was a sequence of repeated cycles of negotiation, commitment, and execution, where failed projects would be reignited (Case 2.2, 3.1, 3.3). Table 13 highlights complementarities found across the focal case companies during the exploration stage.

Exploration stage – Complementarity		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Market knowledge offered by buyer (M)	market knowledge (buyer – government links,	Technical knowledge transfer (TE)
Supplier reputation in the UK market and contacts helped buyer (M, R)	Suppliers offered technology and product knowledge	Prototype development (P)
High, two-way, intense, multiple levels (PS)	Buyer offered technical expertise/ reputation	Idiosyncratic investments in technology adaption (T)
Technical knowledge –quality standards (buyer (M)	late Exploration – one way, (TE, R)	Exchange of tacit knowledge (TE)
Suppliers offered market knowledge (M)	Buyer shared market information and	Supplier product innovations for buyer cost advantages (P)

Suppliers offered buyer technology, product and process expertise (P, T, PS)	increased supply chain visibility to TACO (M)	Supplier product design capabilities (TE)
Joint product development initiatives (P)	Process innovations (PS)	Rebate system for build time improvements (P, PS)
MOCO developed custom licensed product for buyer with opportunity to transfer IP (P, TE)	Open sharing of market information (M)	

Tangible (P, Product; T, Technology; PS, Process) Intangible (M, Market knowledge; TE, technical expertise; R: Reputation).

Table 13 Complementarity in the exploration stage

Similarly, for some cases where uncertainty in the market stalled progression through the exploration stage, partners would **follow a cycle of negotiation to remove uncertainties**, with the aim of starting joint initiatives in the future. For both examples of relationships stalling during the explorations stage, it was observed that **individuals were critical to relationships progressing** (RV theory) as compared to DSO theory which prioritises the properties of the relationship over individuals. Figure 33 illustrates complementarities in the 12 pairs of relationships during the exploration stage

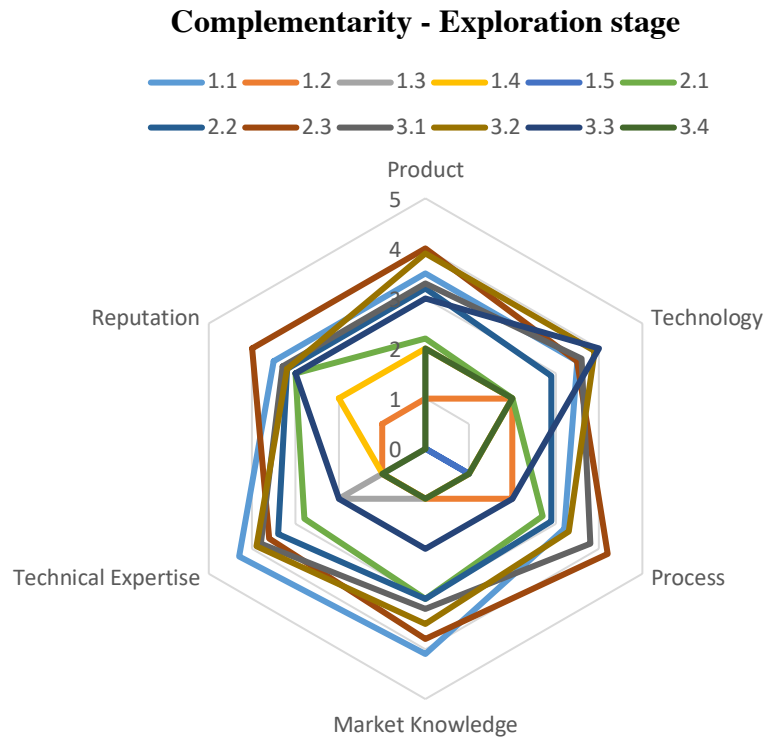


Figure 33 Complementarity in the exploration stage

Table 14 below attempts to combine and synthesise the findings from the radar plot, illustrating the scoring on each element of complementarity (i.e. Product, technology, process, market knowledge, technical expertise, reputation).

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Product	3.5	1	2	2	0	2.2	3.2	4	3.3	3.9	3	2
Technology	3.5	2	2	2	0	2	2.9	3.5	3.6	3.9	4	2
Process	3.2	2	1	1	1	2.7	2.9	4.2	3.8	3.3	2	1
Market Knowledge	4.1	1	1	1	0	3	3	3.8	3.2	3.5	2	1
Technical Expertise	4.3	1	2	1	0	2.8	3.4	3.6	3.8	3.9	2	1
Reputation	3.5	1	0	2	0	3	3.2	4	3.3	3.2	3	0

Table 14 Exploration stage complementarity scores

The case studies show how the building of trust, mutual goals and social bonds is most important in the exploration stage. In the exploration stage, communication becomes more regular and information sharing more intense to gain deeper understanding of a partner's goals and intentions. Communication openness is seen as formal and informal sharing of timely information of plans, goals and expectations (Smith and Barclay, 1997; Anderson and Narus, 1990; Anderson and Weitz, 1992). It also sets out the testing ground where partners are to deliver on the complementarities offered in the awareness stage. The cases illustrate how the buyer and supplier started working on an informal basis with no formal contracts in place, to ensure the long-term trajectory of the relationship. Relationships were sought on the intention to develop long-term relationships through suppliers increasing their orders with the buyers.

4.2.3 Expansion stage

The expansion stage "refers to the continual increase in benefits obtained by exchange partners and to their increasing interdependence" ... "The critical distinction is that the rudiments of trust and joint satisfactions established in the exploration stage now lead to increased risk taking within the dyad. Consequently, the range and depth of mutual dependence increase" (Dwyer et al. 1987: 18). Furthermore, Scanzoni (1979: 791) state "The association has developed or evolved significantly from one characterized by probing, testing examination, and so on, to one characterized by continual enlargement of the kinds of rewards that partners supply one another, and thus increased interdependence."

Compatibility

Despite the differences in culture, the partners made significant investments to overcome any incompatibilities. For example, the staff at the supplier in Case 1.1 made significant changes to their work patterns to cater for the time difference and **demanding cultural expectations** from their customer. However, some cases demonstrated that partners would follow a cyclical relationship trajectory like that suggested by Ring Van de Ven (1994): during the expansion stage, partners would make attempts to work together in new ways to reduce incompatibilities (Case 2.1, 2.2, 3.2, 3.3). When these initiatives did not bring the partners closer together, it would reinforce the doubts in partner capabilities and would introduce problems of trust within the relationship.

For some of the OSW cases, a **major challenge** in developing the relationship during the expansion stage was due to the high levels of uncertainty faced in the market. For example, in several cases, the suppliers would win an order and deliver it to their customer; however, the customer, despite being happy with the supplier's performance, would have to put any potential future orders on hold until political decisions were made. This made it harder for the partners to continue with the level of communication they had developed from previous work and to keep their customers committed to making future orders with them. Case 2.1 illustrated how the relationship with a supplier and buyer started with **high levels of trust and two-way communication**, and then after a year of no transactions, the partners found it difficult to continue with the same level of communication they had initially developed, which made the supplier less aware of any changes or new requirements the buyer had, as well as how the supplier's resources could compliment the buyer. The **lack of communication** from the buyer had an impact on the supplier's trust and saw the relationship move backwards rather than progress to the next stage.

Cases that involved partners from different geographic regions of the world were observed to be more formal in the agreements and negotiations, compared to the cases where partners were both from the UK. For partners in the UK, the negotiations and communication between staff at both firms were informal, flexible, and two-way. This was particularly evident in case 1.2, 3.2 and 3.3 where executives from each firm shared the same vision and had a lot of mutual ground and goals where they were keen to see the UK manufacturing landscape grow and develop (Morgan and Hunt, 1994; Bendapudi and Berry, 1997). Similarities in culture aiding informal governance was observed to work

very well for problem solving and introducing joint innovations together thereby enhancing commitment and building trust within the relationship (Saleh et al. 2019).

For UK focal companies working with foreign partners, incompatibilities would quickly arise when working on joint initiatives, especially when it came to the working routines of each organisation. Depending on the foreign partner, there would be greatly varying expectations on deliverables, on timeliness of responses to queries, and the expected level of time commitments required in the partnership. This was particularly noticeable in Case 1.1, where the UK supplier was fraught with customer demands and the requirement to cater to their every need within time frames that were not usual for the supplier; Participant 1-1-3: “This was difficult for our guys as that’s not the British way.” And Participant 1-1-2: “You will receive an email on Thursday reading that they will be visiting our facility on Monday for an audit, then we are like, oh shit”.

During the expansion stage, compatibility between the partners’ values was seen as vital to building trust, developing a longer-term vision of the relationship and progressing the relationship towards the commitment stage. The steel suppliers in Cases 2.1, 2.2, and 3.1 took sustainability and responsible sourcing very seriously and immediately found a better fit with the customers who shared the same values (Cases 2.2, 2.3, 3.1 and 3.2), while finding it harder to work with customers whose focus was on price (Cases 2.1, 3.3 and 3.4). Incompatibilities between values made it harder to build trust and confidence in the long-term performance of the relationship. In some cases, the vast differences between the partners would lead to significant investment to reduce uncertainties; however, these were not always successful and resulted in making the relationship worse in terms of mutual trust and cooperation. A key factor which led to relationship decline was the lack of communication between partners as well as the lack of cultural understanding (Cases 1.1). For some cases, where the geographic and cultural differences were particularly significant, partners would experience a ‘culture shock’ when beginning to work on joint initiatives together. However, the will of both of the partners to succeed long-term played a large role in overcoming these differences and adjusting to each other’s ‘ways of working’ and expectations and norms; Case 1.1, Participant 1-0-1: “*We match our senior guys with their senior guys, and we match staff across both organisations.*” Where only one of the partners was eager to form a long-term partnership, there were many issues with communication and trust. Relationships tended to stall in the exploration stage when the partners would meet less regularly. Table 15 outlines the compatibilities found in the expansion stage.

Expansion stage – Compatibility		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Efforts by buyer to resolve vast cultural differences (CU)	Routines become more informal as well as having some formal aspects (CU)	Adaptions and convergence of company cultures; (CU)
Investment to strengthen bonds between staff at executive and management (PR)	Bilateral idiosyncratic investments made in joint initiatives (PS)	Increase in mutual risk sharing (PS)
Increasing differences in values and quality expectations of suppliers (VA)	Training of partner's employees (WR)	Increasing emphasis on investing in sustainability (VA)
	Supplier high idiosyncratic investment in product (P)	Relation-specific routines starting to develop (PR)
		Idiosyncratic time investments in adapting existing work routines made by supplier (WR)

CU, Culture; VA, Values; PR, Personal Relationships, WR, Work Routines, Product (P), Process (PS)

Table 15 Compatibility in the expansion stage

For cases from the supplier's perspective, the expansion stage involved the matching of values between the two partners. In particular, the UK suppliers all put strong emphasis on building UK manufacturing competence as well as ensuring that projects would involve UK content. This was illustrated in the offshore wind and steel cases, where both industries were highly politically charged and faced great uncertainty in the market. When the supplier's customer shared the same values, the relationship progressed faster through the expansion stage and towards a long-term committed relationship, whilst, on the other hand, when customers did not share the same values on UK content and UK manufacturing, initiatives would tend to slow and become transactional in nature rather than relational, there would also be less trust between the partners; Participant 2-0-1: "*UK content is becoming a hot potato now; our prospective customers are requiring us to provide a list of all components we source from the UK ... Consequently, we were selling the UK, showing them the UK should be their manufacturing location rather than another country.*" Figure 34 and 35 below, illustrate compatibility and complementarity between cases in the expansion stage.

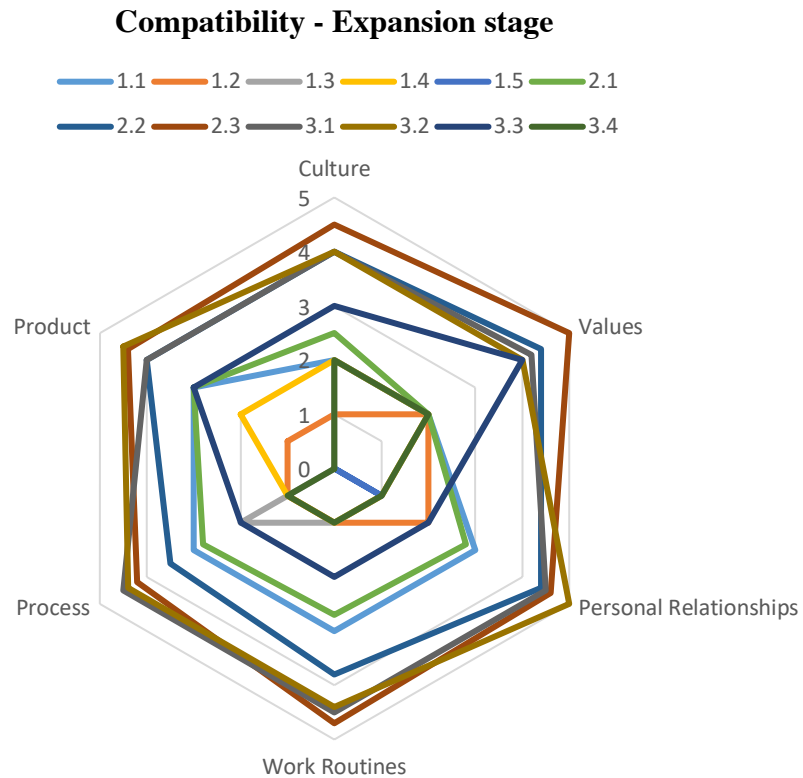


Figure 34 Compatibility in the expansion stage

The significance of each element of compatibility was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 16 below. This scoring system is used for each relationship stage to follow in this thesis.

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Culture	2	1	2	2	0	2.5	4	4.5	4	4	3	2
Values	2	2	2	2	0	2	4.4	5	4.2	4	4	2
Personal Relationships	3	2	1	1	1	2.8	4.4	4.6	4.5	5	2	1
Work Routines	3	1	1	1	0	2.7	3.8	4.7	4.5	4.4	2	1
Process	3	1	2	1	0	2.8	3.5	4.2	4.5	4.4	2	1
Product	3	1	0	2	0	3	4	4.4	4	4.5	3	0

Table 16 Expansion stage compatibility scores

Complementarity

For Cases 1.1, 2.2, 2.3, 3.1 and 3.3, it is observed that both suppliers and customers would invest in building up the relationship despite high market risk and political uncertainty. For example, the focal supplier in Cases 1.1, 2.2, 2.3, 3.1, and 3.2 offered their customer resource complementarities in the form of extensive technical knowledge of product and procurement processes. This **enhanced their customer's performance** and strengthened

the relationship between the partners. In Case 3.2, the supplier made significant investment in the relationship through responding to the buyer's issues with **product quality and delivery performance** (Smith and Barclay, 1997). Staff from the higher levels of the supplier were involved in the relationship to explain just how dedicated they were to the buyer's requirements, that helped build trust and led to a consecutive order larger than the previous one. Case 1.1 illustrated the efforts made by the supplier continue to suggest new ways of **transferring their technical knowledge** to the buyer; however, the joint initiatives could not take place due to the uncertain political situation. Table 17 outlines the complementarities found in the expansion stage.

Expansion stage – Complementarity		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
market knowledge (buyer)	market knowledge (buyer – government links,	Intense technical knowledge transfer (TE)
Supplier reputation in the UK market and contacts helped buyer (M, R)	Suppliers offered technology and product knowledge	Staff-exchanges/ secondments (TE)
Technical knowledge –quality standards issued by buyer (M)	Buyer offered technical expertise/ reputation late Exploration – one way, (TE, R)	IP transfer (small-scale) (P, T)
Suppliers offered market knowledge (M)	Buyer shared market information and increased supply chain visibility to TACO (M)	Bilateral investments in technical knowledge exchange
Suppliers offered buyer technology, product and process expertise (P, T, PS)	Increase in relation-specific technology investments (T)	Bilateral idiosyncratic technology adaption investments (T)
Joint product development initiatives (P)	Product quality improvements made by supplier (P)	Joint-initiatives for technology innovation (T)
MOCO developed custom licensed product for buyer with opportunity to transfer IP (P, TE)	Joint initiatives on product innovations (P)	

Tangible (P, Product; T, Technology; PS, Process) Intangible (M, Market knowledge; TE, technical expertise; R: Reputation.)

Table 17 Complementarity in the expansion stage

The cases illustrated how suppliers who had strong technical knowledge in a product, process, or technology would be required to share this with their partners to continue their relationship. In Case 1.1, this involved intense knowledge transfer through the placement of staff in each other's facilities. It is observed in all cases that partners **pooling resources** allowed each other to learn new and valuable capabilities, initiating and performing on

projects more effectively than alone (Hitt et al. 2000). It is observed that, in some cases, accessing complementary resources through market mechanisms was not always feasible. For example, in the offshore wind industry, no single company had the complete set of competences and resources to develop and deliver projects to fully absorb the magnitude of risk. It is observed that compatibility between companies via organisational cultures and capabilities created value and allowed new partners to realise the synergistic potential of a long-term alliance (Cases 2.2, 2.3, 3.1 and 3.2). Figure 35 below illustrates variances in complementarity between cases during the expansion stage.

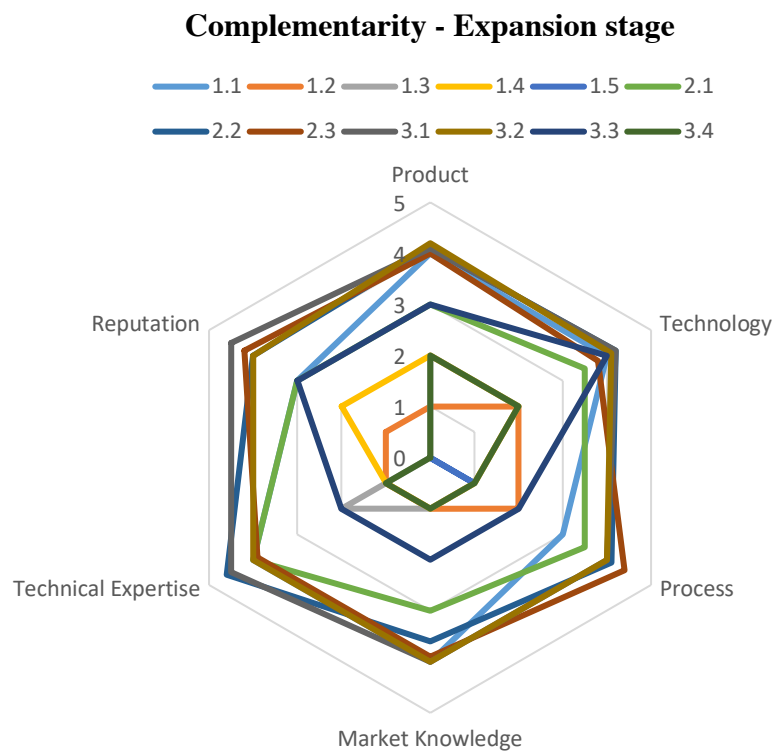


Figure 35 Complementarity in the expansion stage

The significance of each element of complementarity was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 18 below. This scoring system is used for each relationship stage to follow in this thesis.

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Product	4	1	2	2	0	3	4.1	4	4.1	4.2	3	2
Technology	4	2	2	2	0	3.5	4.2	3.8	4.2	4.1	4	2
Process	3	2	1	1	1	3.5	4.1	4.4	4	4	2	1
Market Knowledge	4	1	1	1	0	3	3.6	3.9	4	4	2	1
Technical Expertise	4	1	2	1	0	4	4.6	3.9	4.5	4	2	1
Reputation	3	1	0	2	0	3	4	4.2	4.5	4	3	0

Table 18 Expansion stage complementarity scores

4.2.4 Commitment stage

Commitment, the “enduring desire to maintain a relationship” (Moorman et al. 1993: 316) involves partners quitting the search for alternatives and short-term options, and taking a long-term perspective of a strengthening future relationship (Dwyer et al. 1987). From the cases, it is observed that a similarity in outlook and objectives rather than ownership agreements aided the success of an equity-based partnership. In the commitment stage, similar organisational values were observed to reduce coordination costs between partners and reduce risk via behavioural control and expectation management.

Compatibility

For the cases that reached the commitment stage (Case 2.3), the relationships were characterised by open communication and information exchange, where partners were accessible to each other, were keen to participate, and had a sense of involvement in the relationship. Through open communication, **mutual benefits** were realised, the relationship was more transparent and enabled partners to reduce uncertainty and misunderstandings by allowing the exchange of necessary information (Dwyer et al. 1987; Zacharia et al. 2019). The cases where information sharing was open and reciprocated between partners highlighted their shared interests and lead to common goals being established, that further **increased the quality** of the relationship. Both partners made efforts to overcome the incompatibilities between them, by one buyer **moving closer to the market** and sending staff to work closely with their counterparts in the supplier’s company, while the supplier adjusted the way they worked to follow the pace of SACO. Figure 36 below illustrates variances in compatibility between cases during the commitment stage.

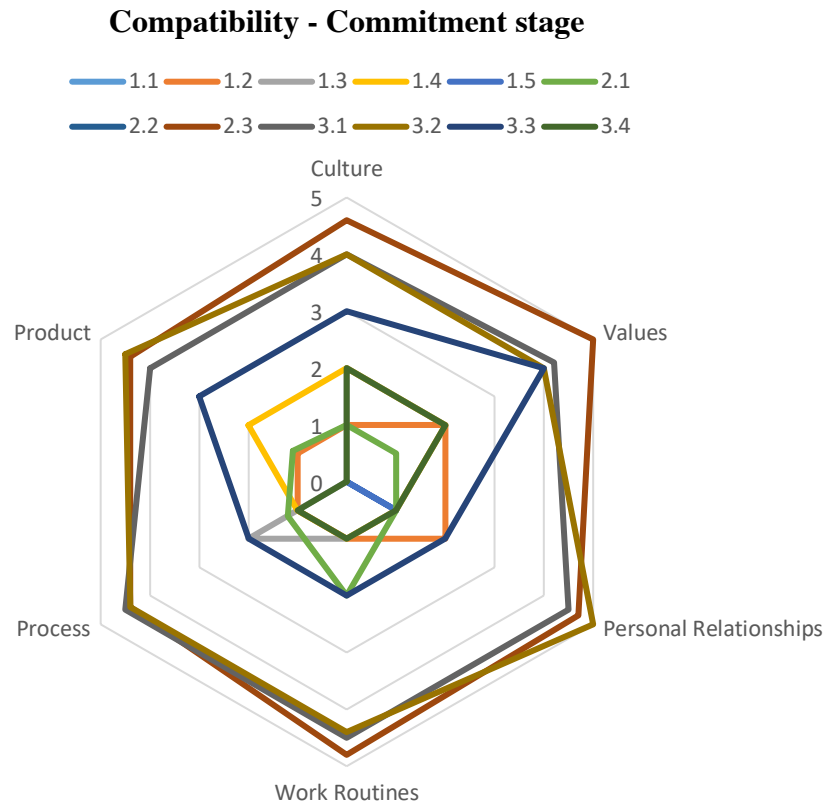


Figure 36 Compatibility in the commitment stage

The significance of each element of compatibility was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 19 below. This scoring system is used for each relationship stage to follow in this thesis.

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Culture	0	1	2	2	0	1	0	4.6	4	4	3	2
Values	0	2	2	2	0	1	0	5	4.2	4	4	2
Personal Relationships	0	2	1	1	1	1	0	4.7	4.5	5	2	1
Work Routines	0	1	1	1	0	2	0	4.8	4.5	4.4	2	1
Process	0	1	2	1	0	1.2	0	4.4	4.5	4.4	2	1
Product	0	1	0	2	0	1.1	0	4.4	4	4.5	3	0

Table 19 Commitment stage compatibility scores

The willingness to invest and create this specific “lock-in” relationship is partly due to the complementarity effect as well as the fact that both the supplier and buyer needed to demonstrate to the market that they had capability in developing newer and larger turbines. However, despite both parties’ efforts to increase compatibility, the relationship had to be terminated due to political uncertainty. Table 20 below details compatibility between focal case companies during the commitment stage.

Commitment stage – Compatibility		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Attempts to reduce vast cultural differences (CU)	Time investments to increase compatibility in culture and working patterns (CU, WR)	Further investment in process technology compatibilities (PS)
Increasing the amounts of relationships spanning multiple levels (PR)	Investments in personal relationships to increase trust (PR)	Further investment in long-term personal relationships between staff (PR)
Attempts to reduce differences in values and quality expectations with suppliers (VA)	Supplier investing further in product and process innovations to please buyers (P, PS)	Bilateral time investments Increase partner satisfaction (PR)

CU, Culture; VA, Values; PR, Personal Relationships, WR, Work Routines, Product (P), Process (PS)

Table 20 Compatibility in the commitment stage

Complementarity

During the commitment stage reached by partners in some of the cases, mutual expectations on continuing the relationship were sought (Anderson and Narus, 1990); in particular, it is observed that **relationship-specific investments** were made that not only aimed to increase commitment, but also to enhance the competitiveness of the alliance. This is seen in Cases 1.1 and 2.2 where suppliers invested in capital equipment to increase the effectiveness of the alliance, and also to demonstrate their reliability to the customer. For the buyer cases, commitment was built upon relationship specific investments in **knowledge transfer** and information exchange. Participant 2-0-1: “You want a relationship as consistent as possible; it’s how you keep injecting life into that relationship and making sure you maintain a high level of contact and discussions. If a customer was busy procuring a contract from another supplier, then naturally they would spend more time on that than with a supplier that wasn’t supplying.” Some of the relationships in focal case 1 and 2 are good examples of partners with incompatibility in culture, but **technological complementarity** drove efforts to overcome incompatibility. For example, the supplier in Case 1 offered technological complementarity through their ability to build prototypes for their customer. Figure 37 below highlights complementarities between cases during the commitment stage.

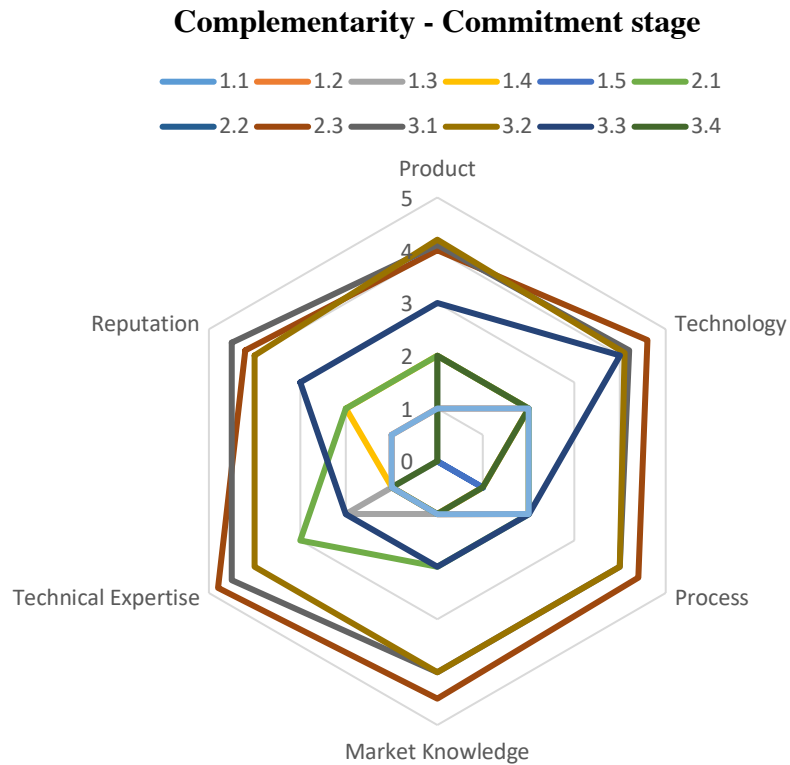


Figure 37 Complementarities in the commitment stage

Table 21 below attempts to combine and synthesise the findings from the radar plot, illustrating the scoring on each element of complementarity (i.e. Product, technology, process, market knowledge, technical expertise, reputation).

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Product	0	1	2	2	0	2	0	4	4.1	4.2	3	2
Technology	0	2	2	2	0	2	0	4.6	4.2	4.1	4	2
Process	0	2	1	1	1	2	0	4.4	4	4	2	1
Market Knowledge	0	1	1	1	0	2	0	4.5	4	4	2	1
Technical Expertise	0	1	2	1	0	3	0	4.8	4.5	4	2	1
Reputation	0	1	0	2	0	2	0	4.2	4.5	4	3	0

Table 21 Commitment stage complementarity scores

In the cases where there was reciprocal commitment of resources to a partnership (Cases 2, 3), **incentive structures** were aligned and confidence was boosted, resulting in more stable long-term relationships. The **reciprocal commitments** of resources to the relationship helped reduce the threat of opportunistic behaviour, and also made the cost of relationship dissolution higher and showed strong intent by both parties to raise relationship quality.

“It’s a fine line for both the buyer and supplier; if you’re not too careful, you can revert back to the very early stages of the relationship and you forget what each other offers, requires in the relationship” (Participant 3-0-1, Case 2.2). Table 22 below outlines complementarities during the commitment stage.

Commitment Stage – Complementarity		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Market knowledge (buyer) (M)	Market knowledge (buyer – government link) (M)	Technical knowledge (supplier– product knowledge, process knowledge) (P, PS, TE)
Contacts in OSW supply chain (R)	High investment in product offerings (P, T)	Processing technology shared (PS)
Buyer reputation in market (R)	Supply chain technology provided by buyer (TE)	High investment in product offerings (P)
High investment in product offerings (P)	Buyer developed supplier’s quality standards (PS)	Suppliers offer product and technology innovations (P/T)
Suppliers offered buyer technology, product and process expertise (P, T, PS)		

Tangible (P, Product; T, Technology; PS, Process) Intangible (M, Market knowledge; TE, technical expertise; R: Reputation.)

Table 22 Complementarity in the commitment stage

4.2.5 Dissolution stage

According to Dwyer et al. (1987: 20) the dissolution stage “begins with an intrapsychic stage in which one party privately evaluates his or her dissatisfactions with the other party, concluding that costs of continuation or modification outweigh benefits. Subsequently, the relationship enters an interactive phase in which the parties negotiate their unbonding.”

Compatibility

Incompatibility in values was a major reason for relationship dissolution, especially in regards to personal relationships among staff. Firstly, there were value sets associated with the company, which in some cases would differ significantly, but attempts could be made to resolve these. However, the value sets of individuals were a contributing factor to **resolving problems** in the relationship. While incompatibilities on a firm level could be resolved, deeper issues on the individual level prevented relationships from resolving incompatibilities.

The dissolution stage saw a **reduction in efforts** by exchange partners to increase compatibilities within the relationship (cases 1.1 and 1.5). Investment in personal relationships and working routines would drop. The dissolution stage also illustrated that even though a relationship exhibited high levels of compatibility between exchange partners, one partner would not consider this enough to reignite the relationship or aim to move the relationship back towards the commitment stage. Sometimes, this was due to the high levels of market and political uncertainty that was out of the control of exchange partners. For some of the relationships studied, it is observed that **information asymmetry** led to power imbalances and ultimately **opportunism**, leading to relationship termination (cases 1.2 and 1.4). There were also issues in quality of product and process technology increasing the level of incompatibility in the relationship which played a large part in **reducing trust** and speeding up relationship dissolution (case 1.4). Figure 38 below highlights complementarities between cases during the dissolution stage. Furthermore, suppliers making the **same mistake twice** in terms of not **delivering to the expected quality standards** in their product led to dissatisfaction from the other partner and played a big part in leading to relationship dissolution (case 2.1).

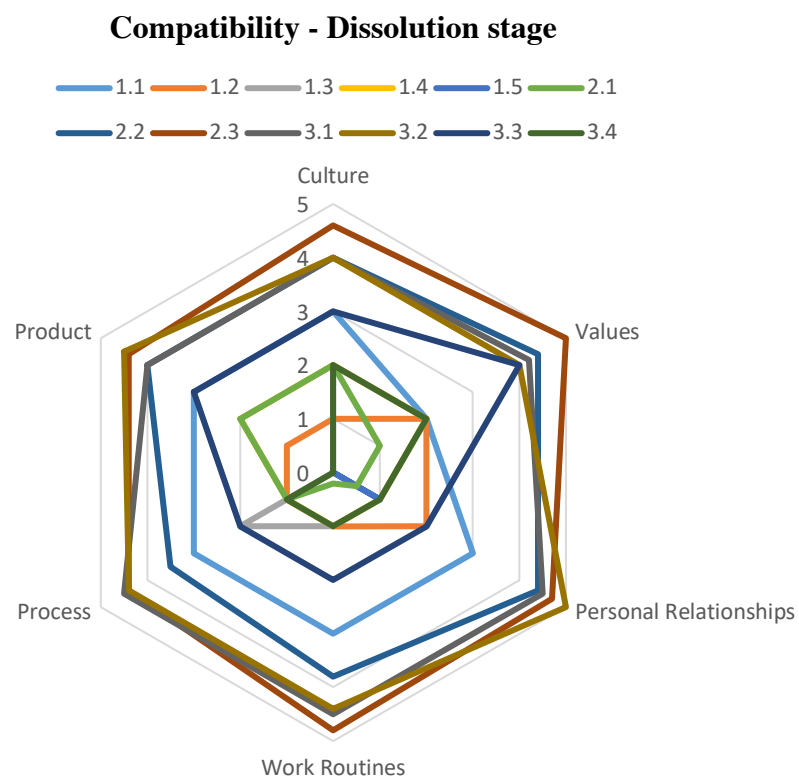


Figure 38 Compatibility in the dissolution stage

The significance of each element of compatibility was based on a scoring system out of five. The significance of the scoring and scale rating is illustrated in table 23 below. This scoring system is used for each relationship stage to follow in this thesis.

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Culture	3	1	2	2	0	2	4	4.6	4	4	3	2
Values	2	2	2	2	0	1	4.4	5	4.2	4	4	2
Personal Relationships	3	2	1	1	1	0.5	4.4	4.7	4.5	5	2	1
Work Routines	3	1	1	1	0	0.2	3.8	4.8	4.5	4.4	2	1
Process	3	1	2	1	0	1	3.5	4.4	4.5	4.4	2	1
Product	3	1	0	2	0	2	4	4.4	4	4.5	3	0

Table 23 Dissolution stage compatibility scores

Table 24 below details the scores of compatibilities between the 12 sets of relationships in the dissolution stage.

Dissolution stage – Compatibility		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Distant buyer, vast cultural differences not being resolved (CU)	Less emphasis on increasing compatibility in culture and working patterns (CU, WR)	Process technology compatibilities stalling (PS)
Personal relationships span multiple levels (PR)	Mutual trust reducing (PR)	Less attention paid to local sourcing requirements (VA)
Differences in values and quality expectations with suppliers not being resolved (VA)	Lack of willingness to adapt to partner values to overcome incompatibilities (VA)	Long-term personal relationships between staff no longer providing value (PR)
	Less emphasis by buyer to engage in joint-initiatives in alignment with shared values (PR, WR)	Reduced informal meetings between senior staff (PR)

CU, Culture; VA, Values; PR, Personal Relationships, WR, Work Routines, Product (P), Process (PS)

Table 24 Compatibility in the dissolution stage

Complementarity

Complementarities during the dissolution stage would often be reduced significantly, as either one party would be unable to offer new types of complementarity to reignite the relationship, or the types of complementarity already offered would cease to be useful for the other party.

Where one partner had offered complementarities in terms of **market knowledge and reputation** to the other partner in the previous stages of relationship development, these would tend to no longer have any use in the later stages, thus contributing to the relationship moving towards the dissolution stage (case 1.1). Furthermore, due to high levels of uncertainty in the market, the knowledge offered by one partner would tend to be a lot less useful thus reducing the need for partners sharing information and working together, leading to dissolution.

The dissolution stage would typically see a **massive reduction in investment** by exchange partners on complementarities such as product, technology and process (cases 1.1, 1.4, 1.5 and 2.1). This led to lower levels of information exchange as well as trust in the relationship. Figure 39 below highlights complementarities between cases during the commitment stage.

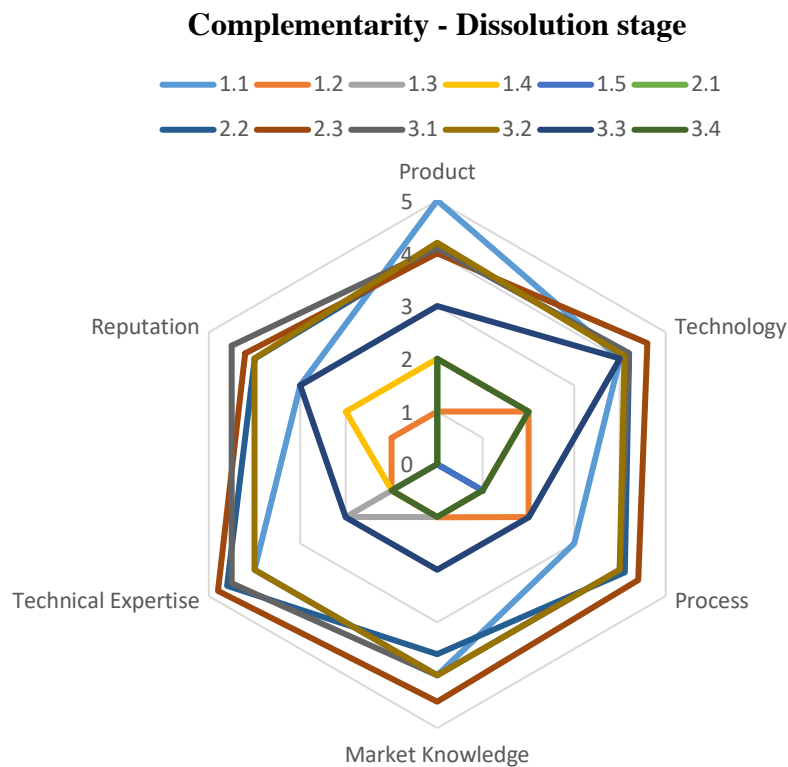


Figure 39 Complementarity in the dissolution stage

Table 25 below attempts to combine and synthesise the findings from the radar plot, illustrating the scoring on each element of complementarity (i.e. Product, technology, process, market knowledge, technical expertise, reputation).

	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Product	5	1	2	2	0	2	4.1	4	4.1	4.2	3	2
Technology	4	2	2	2	0	0	4.2	4.6	4.2	4.1	4	2
Process	3	2	1	1	1	0	4.1	4.4	4	4	2	1
Market knowledge	4	1	1	1	0	0	3.6	4.5	4	4	2	1
Technical expertise	4	1	2	1	0	0	4.6	4.8	4.5	4	2	1
Reputation	3	1	0	2	0	0	4	4.2	4.5	4	3	0

Table 25 Dissolution stage complementarity scores

Table 26 below details the scores of complementarities between the 12 sets of relationships in the dissolution stage.

Dissolution Stage – Complementarity		
Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
Market knowledge no longer needed (buyer) (M)	Market knowledge less important (M)	Reduction in technical knowledge (supplier—product knowledge, process knowledge) (TE, P)
Contacts no longer need in OSW supply chain (R)	Lower investment in product offerings (P, T)	Processing technology no longer shared (PS)
Buyer reputation in market less important (R)	Supply chain technology provided by buyer (TE)	Suppliers reduced product and technology innovations (P/T)
Lowering investment in product offerings (P)	Buyer stopped providing knowledge on supplier's quality standards (PS)	

Tangible (P, Product; T, Technology; PS, Process) Intangible (M, Market knowledge; TE, technical expertise; R: Reputation).

Table 26 Complementarity in the dissolution stage

Table 27 below highlights between case-comparison of governance mechanisms in chronological order.

Case 1: MOCO (supplier/buyer)	Case 2: TACO (supplier)	Case 3: BRCO (supplier)
From the start of the relationship (i.e. awareness stage)		
A five-year contract (F)	Yearly contracts (F)	Three-year contracts (F)
Buyer conducting regular audits of supplier (F)	Formal tenders (F)	Regular informal meetings at operational level (every month)
Impromptu surprise formal visits from buyer (F)	Quarterly audit of suppliers to look for quality improvement with formal reports (F)	management level (every two months) (I)
Six-month contracts renewed on informal basis (I)		

Regular informal meetings(I)	Formal evaluation of performance and quality improvement plans (F)	Regular informal meetings with people of the team (I)
Regular informal meetings with people of the team (I)	Regular meetings with people of the team (I)	Supplier organises special interest group with all buyers to discuss trends (I)
Formal evaluation of performance and quality improvement plans (F)	Buyers conducting regular auditing visits (F)	Informal commitment from buyers (I)
Formal contract in place (F)	Supplier organises open days for all buyers to discuss trends (I)	
Regular performance evaluations from buyer (F)		
Formal meetings to evaluate the performance via performance criteria (I) Yearly audit of suppliers to look more formally at KPIs (F)		

F, Formal Governance Mechanism, I, Informal Governance Mechanism

Table 27 Between case-comparison of governance mechanisms in chronological order

4.3 Cross-case synthesis

The cross-case analysis of this research studies relationship stages qualitatively and longitudinally in order to analyse buyer–supplier from a dynamic perspective. It adds more depth compared to previous studies (Ring and Van de Ven, 1994) by studying a larger set of relationship constructs and their impact on relationship stages. In particular, the cross-case analysis demonstrates the need for exchange partners to put more emphasis on relational constructs and exchanges during the earlier stages of relationship development.

The cross-case analysis shows how the time spent in each relationship stage varies significantly, some relationship would spend years in one stage while other relationships would take months. Relationships in the cross-case did not use time as a measure of relationship development as relationship development was not seen as a linear process, as stated by Dwyer et al. (1987). In fact, the cross-case illustrated that relationships could move backwards and forwards in terms of their development as a result of increasing or decreasing levels of compatibility and complementary that then had an impact on the levels of trust, commitment and information exchange in the relationships. The movement backwards or forwards through stages was determined by the levels of compatibility and complementarity in the relationships. For instance, relationships with high compatibility in values and culture tended to move faster through the awareness stage in comparison with relationships that suffered from high levels of incompatibility. Whilst, where one partner could offer complementarities to the relationship in the early stages (awareness

and exploration), these relationships tended to progress quicker as compared to the relationships with lower levels of complementarities offered by the exchange partners.

Where high levels of incompatibility existed, partners who made investments to increase the level of compatibility would often see the relationship progress to the next stage, in comparison to other relationships where investments were not made and incompatibilities remained, often these relationships would stall in the early stages for years. For relationships where complementarities enabled movement through the early stages, if these complementarities were not continued, or new ones developed, the relationship would stall in the mid stages. Thus, partners would need to invest and come up with new innovations in technology, products and joint initiatives in order to progress their relationship.

Political and market uncertainty had a major effect on the development of relationships in their early stages and mid stages. Even though relationships would progress through early stages through high levels of compatibility and complementarity offered by exchange partners, the changing political and market landscape would often have major impacts on the decisions made by firms to progress the relationship further, this would lead to stagnation of the relationships where they would be stalled in the mid stages waiting for clarity in the market. The lack of clarity and continued uncertainty led to relationships breaking down, even though there were high levels of compatibility and complementarity that brought mutual trust between exchange partners.

While previous studies focus on the effects of compatibility and complementarity on relationship dynamics and development, this cross-case analysis uses longitudinal case studies to provide a more in-depth theoretical analysis of how compatibility and complementarity are used to enhance trust and commitment and can be increased or decreased across the relationship life-cycle. Further, it extends previous studies on inter-firm relationship life-cycle by providing insights on how managing (or mis-managing) compatibility and complementarity affects levels of information exchange, trust and commitment, and vice versa, thereby affecting the speed at which a relationship progresses or regresses through its life-cycle.

5. Conclusions

Following the data collection and data analysis process, this chapter outlines the results and theoretical implications of this research. It begins by summarising the structure of the thesis and analyses the results of the data analysis. Then it discusses the results and provides answers to the research questions, as well as outlining the contributions this thesis makes to research, knowledge and practice. Finally, it outlines the managerial implications of this research, its limitations, and areas for future research.

5.1 Thesis Summary

There are abundant studies of inter-firm relationship formation using concepts such as compatibility, complementarity, and relationship life-cycle. This study is unique because it involves the formation of new inter-firm relationships within the context of high market risk and political uncertainty. It focuses on the OSW sector where customers are seeking innovative solutions from new (and existing) suppliers.

Previous studies often only compare compatibility and complementarity using cross-sectional studies, but the use of longitudinal case studies has allowed the theoretical understanding of how compatibility and complementarity could be enhanced (or decreased) along the relationship life-cycle. In addition, this study extends previous studies of inter-firm relationship life-cycle by revealing how managing (or mis-managing) compatibility and complementarity could have an effect on trust, information sharing, and relationship development, and vice versa.

This thesis makes contributions to existing research by highlighting the importance of dynamic relationship constructs, compatibility, and complementarity in five specific stages of the buyer–supplier relationship lifecycle. It goes further than previous research (Vanpoucke et al. 2014; Palmatier, 2008) by explaining why relationship stages vary in length, as well as examining the triggers that drive a relationship forward from one stage to another.

The research aims to map relational constructs such as compatibility and complementarity to relationship stages set out by Dwyer et al. (1987). Similarly, it confirms that relationships follow distinct stages of development; however, these stages need to be analysed qualitatively and longitudinally in order to analyse buyer–supplier from a dynamic perspective. Further, this research not only confirms Dwyer et al.'s (1987) study

but adds more depth by studying a larger set of relationship constructs and their impact on relationship stages. This research also suggests that relational constructs and exchanges become active and are more effective earlier in relationship development, therefore firms should pay more importance to these early stages.

The framework presented in this research provides a more comprehensive understanding of early-stage buyer–supplier relationship development as it comprises relational constructs that have been developed after the publication of Dwyer et al.’s (1987) framework. For example, compatibility and complementarity are relatively new concepts that have been included in this research’s framework but have been absent from earlier frameworks.

This study agrees with the existing literature that time spent during one stage of the inter-firm relationship varies greatly and it cannot be used as an accurate proxy for the success of the relationship. While all the relationships discussed in this case were in their very early stages, there was significant variation in the duration of stages for different relationships. Some of the relationships took three years to reach the start of the expansion stage, others spent the same amount of time but remained in the awareness or exploration stages, implying that different relationships have different growth speeds, even though many of the customers were equally unable to place an official order, owing to political uncertainty in the OSW market. We discover that the main reason for investing in the new relationships in the OSW market was to find innovation complementarity by exploring innovative solutions from new suppliers, as well as to learn new capabilities from other sectors.

The study makes some contributions to existing theories. While the study shows favour to the RV relationship life-cycle theory that relationship stages may go back and forth, and are not necessarily as linear as first suggested, we also find that the life-cycle could be terminated (and re-ignited) at the exploration and expansion stage owing to market and political uncertainty. The greater the market uncertainty the greater the variance in relationship performance (as measured by the progression through all stages).

5.2 Conclusions regarding the research question

To answer the questions of how and why new inter-firm relationships are built in nascent industries with highly uncertain business environments, four underlying aspects were identified to help with the investigation.

1. What are the major triggers and barriers in the early stages of relationship development, leading to or preventing buyers and suppliers from moving towards a more committed relationship?

Particularly, we discover some insights into trust during the early stage of an inter-firm relationship. Since customers attempted to find suppliers who could develop new innovative solutions that are more effective and economic, the progression of the relationship from awareness stage to the exploration stage required a lot of trust. While the relationship expansion stage was characterised by trust building and expectation of realising benefits through joint initiatives (Vanpoucke et al. 2014) and discovering and testing described by Jap and Anderson (2007), this paper found that these activities started much earlier in the life-cycle, where potential partners undertook trust-building exercises and gave expectations on shared benefits in the exploration stage. Instead, developing trust earlier enabled them to be more prepared for when the political situation became clear; this is supported by Narayandas and Rangan (2004: 72) who found trust should be created first “to enable the parties to proceed to executing the informal commitments implicit in their psychological contract, which then set the stage for the establishment of formal commitments.”

In the awareness stage, communication between key individuals of each firm was important in forming the relationship and was seen as a major trigger that enabled partners to move towards the exploration stage. Furthermore, communication was an active relationship construct in all relationship stages, having a positive effect on satisfaction and trustworthiness between partners. This supports Palmatier’s (2008) findings that “communication appears to be the most universally positive antecedent in terms of strengthening initial levels of trust and commitment, as well as relating to positive growth rates in the future” (2008: 62). It was vital for suppliers to have key personnel in place that could communicate effectively with staff of the buyer firm; in particular, much importance was placed on the ability or competence of personnel to develop close social bonds and personal relationships (Kaufmann et al. 2018) with their counterparts, in order to build trust and look towards longer-term relationship commitment.

A key dynamic that would ensure the relationship would be triggered from the awareness to the exploration stage was the ability of one partner to ensure that their counterpart was effectively attached to the goals and values of their partner; this finding supported the

study of Gundlach et al. (1995). On the other hand, where firms did not share the same values or goals, partners would need to show willingness to make efforts to increase compatibility in the relationship.

During the awareness stage, the exchange of information, being both frank and two-way, led to relationships progressing much more quickly, compared to when information was shared one-way and was less open between partners. Information sharing, whether regarding knowledge of the market – especially in nascent industry such as OSW, as well as market demand pipelines, was observed to be a major factor in triggering the relationship from awareness to exploration, supporting the findings of Palmatier (2008) and Holdne and O’Toole (2004). However, in addition, this research found that the exchange of confidential and detailed information took place much earlier compared to the findings of Palmatier (2008), and was seen as more crucial to the speeding up of the relationship through early stages.

Sharing information with a partner helped them to develop the perception that a longer-term relationship was a possibility, whilst cases that displayed a low level of information sharing during the awareness stage tended to stall, as the one partner saw it as less likely that it would happen should the relationship progress further. Further, importance was paid to the quality of information shared; for instance, partners who shared confidential or private information on products and market demand with their counterparts built trust more quickly compared to relationships where partners only shared basic information.

In the exploration stage, the relationship was triggered to expansion when the personnel involved in developing the relationship portrayed that their firm would act in the best interests of the other firm. While this confirms the study of Crosby et al. (1990) it also found that despite partners displaying loyalty to one another, the relationship did not always progress due to the high levels of uncertainty and sometimes opportunistic behaviour shown by the dominant partner. The research findings agree with Podsakoff et al. (1990), in that an important factor in developing a successful relationship during the exploration stage was the ability for one partner to have the willingness and confidence to rely on their counterpart. During the exploration stage, the supplier had to ensure that they could deliver on the expectations set out with the buyer, which was done by building the trust of the buyer through personal relationship development; this shared similar findings with Sirdeshmukh et al. (2002); however, this research places a lot more

emphasis on personal relationships being a major factor in building trust and progressing the relationship into the expansion stage.

A major factor that helped relationship development during the exploration stage was the extent to which both parties would undertake joint initiatives with joint investment. Where the initiatives went well, the relationship progressed faster through the exploration stage and more toward a longer-term vision of a partnership, siding with Mohr et al.'s (1996) findings. Where a supplier could solve problems for the buyer, the level of trust and willingness to pursue a long-term partnership increased dramatically. This finding provides further detail to Vanpoucke et al.'s (2014) study, positing that collaborative projects took place in the expansion and commitment stages, while this research found that these types of joint initiatives actually took place earlier, in the exploration stage, highlighting the need to study in more detail how fast trust is built with the use of collaborative projects in the exploration stage.

Another trigger during the exploration stage was when both parties would pool resources on a specific task or project. When both parties jointly invested, they showed more commitment to one another which built more trust. Relation-specific investments helped partners strengthen bonds and highlighted perceived costs associated with dissolving the relationship. This finding confirms Gruen et al.'s (2000) study, but furthers it by examining which relation-specific investments work better at building long-term relationships; for instance, whether it is investment in a particular technology, process, or product. The firms that undertook joint problem-solving tasks together developed closer relationships between staff members, which helped build trust and commitment and reduced the amount of time the relationship spent in the exploration stage. The cases where firms developed relational norms and common working routines tended to progress through the exploration stage a lot more quickly than firms who worked at arm's length.

Suppliers in the OSW industry were often dependent on the buyer and would take big risks by investing in the relationship speculatively in goodwill even when relationship satisfaction was low, in the hope that they could progress from the exploration to expansion stage. Suppliers would try their best to increase compatibility and offer complementarities to keep the relationship active, even when buyers were acting in destructive ways, due to the dominance of the buyer.

2. How are complementary resources valued by buyers and suppliers such that they are willing to invest in new relationship formation?

Suppliers who provided complementary products and technology to their counterparts typically saw faster movement through the awareness and exploration stages. In the awareness stage, the perceived credibility and benevolence of the staff member involved in developing the relationship was of paramount importance for the relationship to be triggered into the exploration stage. This finding coincides with Doney and Cannon's (1997) study but takes it a step further, by examining in more detail how staff members would build their credibility with their counterpart; for instance, by making sacrifices in their working life to satisfy the partner's expectations. The cases that involved personal relationship communicating on an informal level tended to bond more quickly compared to relationships that had formal communication and procedures in place.

Partners who had access to information that the other partner required tended to be in a good position to speed up relationship development. For many supplier cases, their knowledge and experience in their sector allowed them to gain a lot of credibility and respect from their partners helping progress the relationship to the next stage. Suppliers also gained a lot of complementary knowledge from buyers who had a wider knowledge base of the market; this helped the supplier build a higher level of trust with the buyer, especially when the knowledge shared to the supplier was confidential and considered private.

The complementary resources offered by the buyers were often different from the supplier offerings. For instance, buyers in the OSW industry sometimes had greater experience in OSW and so were able to develop their suppliers by providing technical information on how the suppliers could reach the high-quality standards required by the OSW sector. The buyers would typically be dealing with OEMs who set the requirements for quality; thus, buyers would offer supplier complementarities in terms of process improvements, but also valuable market information that was not visible to the suppliers that helped them on planning how to set up their associated supply chains. Buyers could offer suppliers high-level visibility on future orders, instruct them on how to improve quality processes, as well as provide them with consumer demand information that would enable them to develop new products in line with market demand.

Complementary resources were one of the most important factors of relationship development in the exploration and expansion stage. Suppliers who offered high levels

of complementarities where there were few alternative sources of supply were able to move through early stages more quickly than suppliers who had fewer critical resources to offer and relied more on increasing compatibility in the relationship.

Furthermore, suppliers typically would have to make high investments in terms of time spent communicating their offering effectively to highlight the complementary capabilities their firm could offer to the buyer, and why they were unique compared to other suppliers they were competing with. Investments also had to be made for staff to travel regularly to the partner firm, who was often geographically distant. Investments also had to be made by the supplier or buyer to make them 'look the part' i.e. had complementary knowledge, products, or technical expertise that could not easily be substituted and that, when pooled with their potential partner, could provide vast value for both firms.

An important finding in the process of relationship development indicates that management in a buyer or supplier firm should be aware of increasing dependence on a partner leading to potential opportunistic and untrustworthy behaviour by the dominant partner. Where both partners bring complementary resources to the relationship, benefits are realised from both sides and mutual respect can be established. However, when one partner provides limited complementary resources compared to the other, there is little incentive to work with the weaker partner, which in many cases in this research were the suppliers. For example, many of the OSW suppliers had to accept the demands of the buyer due to the buyer's power and dominant position.

3. What are the major issues related to compatibility and how are incompatibilities overcome?

Firms that had high compatibility, especially culturally and sharing similar values, could cope much better through uncertain times and would move through initial relationship stages faster than firm who had less in common with each other, who would typically spend more time in the initial stages (awareness, exploration, and expansion). Relationships with high compatibility from the beginning saw higher relation-specific investments from both sides and nurtured mutual trust faster, leading to speedier movement through early stages.

This study confirms that high inter-firm compatibility improves performance and speeds up relationship development when uncertainty is high. Due to the high levels of uncertainty in the OSW sector, interpersonal trust and commitment were sought earlier

than previous studies suggest. Both were effective governance mechanisms that provided stability in the relationship, helping it progress more quickly. Further, with trust in place, partners had high compatibility; they engaged in more joint initiatives, increasing the investment in relation-specific resources in the relationship, and promoting relationship satisfaction and faster movement towards a mature stage.

Once entering the exploration stage, partners' assessments of each other's values, particularly sustainable, were called into question; in the OSW cases, UK suppliers would expect their customers to share a similar culture in sustainability and responsible sourcing, whilst their potential customers did not always align their values, which would set out immediate incompatibilities between staff across all levels of both organisations. Furthermore, the cases showed how compatibility in culture and values from historical ties and geography, and emphasis on sustainability and the development of UK industry, would increase compatibility of the partners. This finding is supported by Awan (2019) who suggests relational governance has a key role in the continuation of a relationship and helps improve the social performance of a relationship by investing significant resources in the relationship and improving information exchange through cultural intelligence.

Partners who found common ground, either through personal relationships or the values that both shared, triggered the exploration stage much more quickly, compared to partners who had less in common in terms of values and culture, who would typically spend much longer in the awareness stage trying to increase the level of compatibility and between the firms. This study found that compatibility in terms of personal relationships, shared goals, and culture had more significance in the exploration stage, compared to partners focusing solely on contract and price negotiations suggested by Vanpoucke et al's (2014) study.

4. What are the effects of high uncertainty on early-stage relationship development, and how can uncertainty be reduced?

All cases in this study involved firms in highly uncertain environments, be it due to the nascence of the OSW market and the political effects. Firms would invest much effort to develop close relationships as quickly as possible to reduce uncertainty, and would often take big risks to speed up the bonding process and gain trust. This study observed that personal relationships were made much earlier in the relationship; in doing so, the

relationship would travel much faster through the awareness stage into the exploration stage.

Most of the relationships studied saw partners experiencing high uncertainty throughout their relationship; this had a slowing effect in the exploration and expansion stage. The ability to build trust was a major issue that stalled many of the cases from 'weathering the bad times' together. Communication and information exchange were key to ensure relationships would not dissolve; in many of the cases it is observed that communication would break down, be one-way, and lead to dissolution. Personal relationship was vital to keeping relationships active and gauging the intentions of each firm. In particular, some relationships that were adversarial had transformed to collaborative through effective organisational trust repair, where interpersonal ties helped prevent initial interorganisational trust loss (Kaufmann et al. 2018).

There are ways to reduce uncertainty during early stage of an inter-firm relationship (Moorman et al. 1993; Dwyer et al. 1987). This study discovers the importance of repeating and growing orders or transactions in order to make the initial relationships more stable. The repeated transactions between the two firms enhanced the effectiveness and efficiency of the interaction by creating mutual understanding of routines and processes (Dyer and Singh, 1998). Dealing regularly with each other enabled the teams of staff to develop efficiency-enhancing routines, that helped organise the partnership and develop methods for joint problem solving and conflict resolution. The two firms developed relational-specific absorptive capacity where regular knowledge transfer routines would take place, facilitating the learning process, which increased the level of compatibility and trust in the dyad.

Further, partly due to the uncertainty faced in the UK OSW industry, knowledge and resource sharing initiatives between partners began earlier in the exploration stage, unlike in the commitment stage suggested by Vanpoucke et al. (2014). Further, whilst the exploration stage usually focuses on contract and price negotiations, this study found that collaborative activities also began earlier in this stage, rather than in the expansion or commitment stage. The results of this study explain why Palmatier et al. (2013) found that relationship age does not provide a clear indication of relationship development stage and that relationships move through stages at different rates. Hence, the role of the manager is not only negotiator but also project manager in the exploration stage.

For many of the cases studied, high uncertainty made progression through stages much more difficult; one way of reducing uncertainty was for partners to show their intentions upfront and behave in a manner supportive of relationship longevity (Fournier, 1998). This was sometimes done by making further investments in the relationship, although due to such a high and prolonged level of uncertainty, investment and good intentions were not always enough to keep the relationship progressing toward a longer-term partnership. The search for innovation complementarity required a lot more trust at the early stage of a relationship than previously taught. Such a trust, which is also essential for a lock-in situation for longer-term alliance (Main Anh et al. 2018), could be increased by working together to enhance compatibility and complementarity. While matching theory provides interesting concepts for analysing compatibility and complementarity, this study shows that firms attempting to seek innovation complementarity should be prepared to invest in building the relationship by sharing more information and showing more willingness to address incompatibility issues at the very beginning. These steps could also reduce risk.

5.3 Theoretical Contributions of the Research

This thesis has advanced the conceptual framework developed from the literature review in chapter 2. The advanced framework can be seen below in Figure 40.

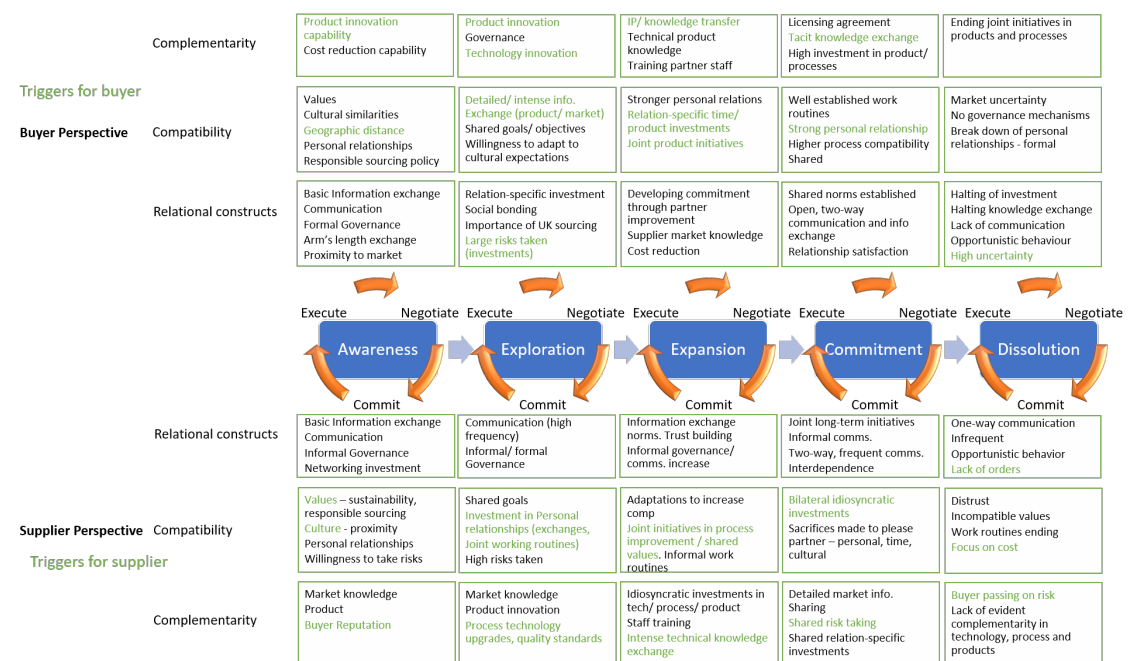


Figure 40 Theoretically advancing the framework

The framework has been advanced both through the buyer and supplier perspectives as well as advancing the dyadic and triadic interaction in more granular detail. The following contributions have been pinpointed and can be found below.

- ***In the early stage of a new buyer-supplier relationship, the relationship develops following a non-linear interactive process, which may go forward and backward between stages, due to a constant (re-)assessment of the relationships and changing in expectations.***

This thesis critically evaluates two contradictory relationship life-cycle theories namely, Dwyer et al. (1987) who describe relationship development as a linear, discrete process, and Ring and Van de Ven (1994) who posit the relationship process as cyclical and iterative. My findings agree with Vanpoucke et al.'s (2014: 27) conclusion that both theories are “not so much incompatible as complementary in nature.” However, the findings of this research disagree with Vanpoucke et al. (2014) when they suggest relationships in the awareness and exploration stage follow a linear process and evolve into a cyclical process in the later stages. In fact, this study finds that under highly uncertain environments relationships in the awareness and exploration stage follow an iterative process that can be cyclical in nature, involving the constant negotiation, commitment and execution of tasks and initiatives. High uncertainty leads to partners initial agreements being dropped and expectations constantly changing. Thus, the cyclical process allows partners to continuously reassess their position and future intentions. Further, during the awareness and exploration stages relationships can move backward or forward on their own unique trajectory making them unpredictable in nature and requiring relentless evaluation and assessment, thus requiring a human element to relationship development much earlier in relationship development, in contrast to Vanpoucke et al. (2014) who suggest this happens only when the relationship reaches the expansion stage.

Another contradiction with Vanpoucke et al.'s (2014) study finds that relationships with positive developments are not most likely to continue the same growth trend into the future, instead, largely owing to market and political uncertainty, especially for the OSW cases, relationships that have positive beginnings can reverse or break down dramatically and do not follow a linear growth trend whatsoever, despite both partners best efforts. This research agrees with the findings of Vanpoucke et al. (2014) who find that RV cyclical theory is complementary to DSO theory, however, adding to Vanpoucke et al. (2014) this research finds that RV theory is not separately complementing DSO but

instead taking place within each relationship stage of DSO theory, and can take place many times within the same relationship stage.

- *The use of relationship age as a factor to explain relationship outcome is misleading, because various types of uncertainty can affect the time taken to develop compatibility and realise the potential of complementarity, and the time taken to develop relational constructs vary significantly under different circumstances.*

This research confirms the findings of Palmatier et al. (2013) who states that relationship age does not offer a good evaluation of relationship performance nor does it give a sign of the relationship development stage. Furthermore, the findings of this thesis support life-cycle theories (Dwyer et al. 1987; Ring and Van de Ven, 1994; Vanpoucke et al. 2014; Palmatier, 2008) that relationships move through stages at different speeds. This study provides a more in-depth analysis on how different types of uncertainty (i.e. political and market) can affect the speed of relationship development and progression through relationship stages. For instance, during the exploration and expansions stages, when market uncertainty was high, firms spent longer times in these stages, investing more heavily on relation specific activities in order to build more trust and “weather the storm” in order to be prepared for when it calmed. Due to high uncertainty faced by buyers and suppliers, more importance was placed on building trust in the exploration stage in contrast to Vanpoucke et al. (2014) and Palmatier et al. (2013) who state trust building took place in expansion and commitment stages.

- *Relationship constructs such as information exchange, personal relationships, goal compatibility and time investments have more importance in the awareness and exploration stages.*

In contradiction to Vanpoucke et al.’s (2014) study who state that formal mechanisms are used to govern relationships in their early stages, this research finds that some of the more successful early-stage relationships adopted informal governance mechanisms. This was mainly due to the fact that informal mechanisms gave partners more flexibility enabling them to cope better to market and political changes. The informal nature of personal relationships also enabled staff to spend more time innovating on products and processes that would be later set up and formalised into joint ventures. This finding differs from Ring and Van de Ven’s (1994) study who suggest informal psychological contracts may compensate or substitute formal contractual safeguards as trust between parties increases

over time. This study found that informal dealings between companies would compensate formal contractual safeguards much sooner in the relationship, instead of waiting for trust to build over time.

Information exchange in the early stages of the relationship was key to understanding each partners' expectations and also gauging the benefits that be realised from each parties' complementary resources offered. Due to the nascent and volatile conditions of the OSW industry, information exchange in the early stages was vital to establish common grounds and ways to circumvent challenges arising from market uncertainties.

This study disagrees with Wagner (2011) who states relationship properties such as information exchange, goal congruence and idiosyncratic time investments are low in the exploration stage. The study found that facing high uncertainty, suppliers would take large risks investing time and resources into the relationship in the exploration stage in order to build the trust of the buyer and gain their commitment to doing business in the future. However, despite making investments speculatively and taking large risks to satisfy the buyer, the relationship did not necessarily progress to the expansion stage, mainly owing to ongoing uncertainty in the market.

- *Relationship constructs such as values and culture play an important role in resolving differences and tackling challenges exchange partners face in the early stages of relationship development*

In the exploration and expansion stages when suppliers could not offer a lower price compared to their competitors their alignment of values and culture had significant impact on the negotiation with the buyer. Suppliers were able to tackle this issue and progress through these stages by offering intangible benefits that would illustrate the long-term commitment they were willing to undertake should the buyer accept to purchase their product.

This study contributes to relational theories such as Ring and Van de Ven (1994) and Dwyer et al. (1987) by providing detailed insights into how compatibilities in culture and values aids relationship development. With high levels of compatibility between cultures of exchange partners, resolving issues in the relationship became much easier, the speed at which partners would negotiate, commit and execute activities would be much faster as compared to relationships exhibiting low levels of compatibility in culture. High compatibility in culture garnered more trust in the relationship which was seen as crucial for progressing through the early stages at a faster rate. Compatibilities in values also

sped up the early stage development process as trust would be established much quicker compared to relationships with high levels of compatibility in values.

This study extends the work of Ring and Van de Ven (1994) by covering relational constructs in more detail and how they affect the cyclical process of relationship development. Specifically, this study looks at a more complex set of conditions that impact on the development process. For instance, the study of cases from a range of different nation states show how differences in culture (i.e. language and expectations) and values (i.e. responsible or sustainable sourcing over price) can significantly speed up or slow down the ability of partners to negotiate, commit to and execute joint initiatives. Relationships with incompatibilities in cultures found it very difficult, time consuming and frustrating in the initial formation stages, suppliers would typically take big risks and comprises in order to satisfy and build trust with their buyer, to win orders.

- *Compatibility and complementarity play as important roles as relational constructs in the development of new supplier-buyer relationship, in that they are key goals that drive the investment in the new relationship.*

This research reveals that suppliers who made buyers aware of the complementarities they could offer in product, technology, process and technical expertise would help them be seen as a feasible partner and would trigger the relationship into the exploration stage. This was particularly the case for the OSW suppliers who made strong efforts to improve the buyer's performance.

While Vanpoucke et al. (2014) state that relationships in the early stages focused primarily on cost, this is not true for some of the cases in this research. Partners were more concerned that their values and long-term goals aligned with one another, and would choose partners who were more compatible, despite them offering a costlier product than their competitors. When partners had high compatibility, they started joint initiatives in the exploration stage whilst studies suggest integration initiatives only start in the expansion stage (Vanpoucke et al. 2014).

The results of thesis provide a unique contribution to the understanding of how compatibility and complementarity affect relationship life-cycle development as they suggest that the different constructs of compatibility and complementarity play an important part in early-stage relationship development.

Compatibility in values and culture are very important in the awareness and exploration stage, despite studies. Partners who were highly compatible moved through awareness and exploration stages much quicker than partners who had incompatibilities in values, culture and processes. These relationships spent more time in the awareness and exploration stage making efforts to increase compatibility.

Product and technology complementarity was a major factor in triggering relationships from the exploration to expansion stage, particularly for suppliers hoping to win consecutive or larger orders from their buyers. If the supplier could effectively present their complementary product or technology to the buyer, they were more likely to progress through stages. Thus, communication between the partners was seen as vital in the early stages for communicating benefits of the proposed product or technology innovations. Another relational factor that was not studied by Vanpoucke et al. (2014) or Ring and Van de Ven (1994) was complementarity in terms of a partner's reputation. This study found that where relationships involved one established and one new entrant to the OSW sector, the reputation of the established partner would provide crucial to securing more commitment and trust from the other partner.

- *Differences in supplier and buyer perspectives affect the time spent on developing compatibility and complementarity and progress in relationship development.*

Previous studies on buyer-supplier relationship life-cycles have been bias towards the buyer's perspective of the relationship (Vanpoucke et al. 2014; Palmatier et al. 2013; Wagner, 2011), while this study takes both supplier and buyer perspectives into account offering a more detailed account of relationship development and highlighting the differences between each parties' efforts towards developing the relationship. Furthermore, this research has added to the findings of previous life-cycle studies by examining the different triggers according to the perspectives of both the supplier and the buyer. It has distinguished that buyer and suppliers have different triggers for each relationship stage, which has not been studied in detail before.

Another important contribution to Dwyer et al.'s (1987) framework is that, though this research confirms the definition and characteristics of each relationship stage, it illustrates that firms should place more importance on the early stages, namely, the awareness and exploration stage. This research highlights that relationship constructs come into play a lot earlier than previous research suggests. For example, it is observed that there is a need

for information sharing and communication to occur in earlier stages, due to the high uncertainty faced by partners, so that they can build trust in one another reducing the level of uncertainty.

Research on relational dynamics also addresses a key gap noted by Lewicki et al. (2006: 991), specifically, that little attention is paid to “conceptualising and measuring relationship development over time”; instead, most research “has taken a static ‘snapshot’ view” of relationships. Supply chain relationships are constantly changing over time, yet most research takes a snapshot of the level of relationship constructs (Palmatier et al. 2013).

This research contributes to previous studies by capturing dynamic relationship constructs longitudinally, that is insightful to buyer–seller relationship development and performance. Another interesting aspect of the framework presented in this essay is that it not only illustrates how a relationship evolves, but also shows how the constructs themselves develop over the course of a relationship.

While many buyer–supplier relationship studies have been limited to the bright side of relationships (Vanpoucke et al. 2014; Vandenbosch and Sapp, 2010; Anderson and Jap, 2005), this research goes further to include relationships that have moved towards dissolution. Thus, it provides insights as to why relationships go into dissolution and what measures managers can take to avoid it.

This research contributes to previous studies (e.g. Ring and Van de Ven, 1994) by applying numerous relational dynamic’s such as compatibility (values, culture, personal relationships and work routines) and complementarity (product, process, market knowledge and technical expertise) to the development of new interfirm relationships. By doing this, the research shares insights on how specific constructs affect each stage of Ring Van de Ven’s (1994) process framework (i.e. negotiations, commitments and executions). For example, in the negotiation stage this study finds that partners who have high compatibility in personal relationships and work routines are able to conduct more effective informal sense making and formal bargaining and enables partners to identify and reduce specific incompatibilities helping the relationship move faster towards the commitment stage.

Progressing the research of Dwyer et al. (1987), the framework presented in this study provides a more in-depth understanding of the relationship formation process between buyers and suppliers in highly uncertain industries; in particular, how compatibility and

complementarity constructs influence the speed of relationship development from one stage to the next.

5.3.1 Contribution to Knowledge

Previous studies on buyer–supplier relationship development are mostly from a buyer’s perspective, while this research takes a more thorough approach to analysing relationship dynamics from a supplier’s perspective. Most supplier cases highlighted the importance paid by the supplier to satisfying the buyer to develop a successful long-term relationship, and illustrated the importance of compatibility and complementary relationship variables in the buyer–supplier relationship. Whilst Vanpoucke et al. (2014) focus on successful buy-sell relationships, this study contributes to knowledge by examining relationships, not only in the early stages but how relational constructs can help to reduce incompatibilities that bring relationships to dissolution. Furthermore, this research develops a dynamic approach to predicting behavioural changes within buyer-supplier relationships (Rabelo et al. 2008) as well as the conditions for required for successful or failing relationships. This research extends Vanpoucke et al’s (2014) work on sole suppliers in successful relationships by analysing cases, not only from the supplier’s perspective with multiple buyers, but also the buyer’s perspective working with multiple suppliers. Additionally, this study included multiple partners from different countries enabling increased generalisability by recognising wider cross-cultural issues within buyer-supplier relationship development (Cheung et al. 2010).

This research builds on the study of Hennelly and Wong (2016) by examining a greater number of cases in more detail with a larger set of relational constructs, thereby increasing validity and generalisability.

Palmatier et al’s (2013) study focuses on one governance mechanism in buyer-supplier relationships, namely trust, while this research develops a much more detailed theory of relationship dynamics by investigating other mechanisms that have different dynamic properties that can either substitute or complement trust (i.e. commitment, trust and information exchange).

As Ring and Van de Ven (1994) point out that it is increasingly important to understand developmental processes in buyer supplier relationships facing heightened levels of uncertainty and complexity. This research contributes to existing theory by focusing on the forming of new relationships in the nascent OSW sector, both of these factors increase levels of uncertainty and uncover new insights as to how partners can build trust, reduce

conflict and incompatibilities and develop internal appropriate governance structures to manage them.

The dyadic interaction between buyer and supplier is triggered by mutual trust and loyalty. Relational capital is accrued when there is strategic momentum to innovate or to compete on quality, design or technical specifications. The relationship is quickly reset and interrupted when the focus is re-oriented towards lowering cost or a price driven strategy. Once transactional economics starts to dominate the relational network there is evidently a rapid dissolution trigger.

While DSO and RV theories offer useful insights into business relationship evolution, they do not cover in detail the specific factors that lead to changes in the perceptions and behaviours of actors involved in the relationship. This study contributes to and extends these life-cycle theories by diving deeper into relationship dynamics and how specific relational constructs affect trust, commitment movement, information exchange and governance structures which help move a relationship (forwards or backwards) from one stage to the next. Furthermore, this study explains how these relational constructs can be developed by partners to increase compatibility and complementarity in order to speed up relationship development as well as reignite failing or stalling relationships.

5.3.2 Contribution to Methodology

In its investigation of the impact of compatibility and complementarity on early stage buyer–supplier relationships, this study introduced the critical realist method to supply chain management research. Subsequently, it follows the call for more use of qualitative methods in supply chain management research.

5.3.3 Managerial Implications

Through the analysis of the impact of relationship dynamics, complementarity, and compatibility on early stage buyer–supplier relationships, this research contributes to practice, by providing insights on how relationship development can be speeded up reach a level of commitment that provides a strong indicator of future sales growth and long-term relationship orientation.

This research suggests that relationship age is not always associated with better performance (Reinartz and Kumar, 2000). For partners with previous ties, it is important to recognise when the relationship is stagnating and going into dissolution, in order to take appropriate action to re-establish growth.

On one hand, this research can help managers and executives in buyer firms when forming new relationships with suppliers, specifically what relational constructs to focus on in the awareness stage of the relationship. For instance, to engage in open and frequent information exchange in order to gain trust as well as make efforts to reduce any incompatibilities in values and culture and increase the compatibility of personal relationship between key staff across multiple hierarchies. On the other hand, this research also helps managers and executives in supplier firms who are initiating a new relationship with a potential buyer. Specifically, what complementarities are important to offer and make the buyer aware of from the start in order to progress from the awareness to exploration stage. For example, providing in-depth market knowledge or making the buyer aware of specific technical expertise that would complement the buyer's operations and increase communication and information exchange between the partners. The radar plots are especially useful for managers as they can be used as a tool or mechanism to gauge which relational constructs are most important and effective in each stage of the relationship, thus providing a guide on where to invest their efforts in relationship development.

Managers should realise the strong impact of complementary resources on relationship development and performance, as well as strategies to increase compatibility to improve performance. This study found that there is huge importance to be placed on the human aspects of buyer-supplier relationships in their early stages of development. It is observed that partners who are satisfied with their counterpart's employee performance and their interpersonal treatment of each other i.e. ability to cater to their needs (especially buyer's needs) enables partners to build trust and commitment more quickly, therefore allowing relationships to progress faster through early stages. Consequently, this finding has implications for training and development of staff of the supplier company, to recognise and cater to the needs of their partner and gain their commitment to a long-term partnership.

This research illustrated that relationships do not always follow a smooth path towards a committed relationship; therefore, developing a relationship towards a committed stage involved continuous efforts and investments by both partners. Consequently, this research advises that managers experiencing difficulties in their relationship should not give up, and instead introduce new ideas for joint initiatives in order to reignite the relationship.

5.4 Limitations and Future Research

As this research studied early stage relationship development, it was limited by the small sample size in the mature/ decline stage. Consequently, this had two significant implications. Firstly, it would be beneficial to conduct further research on the impact of compatibility and complementarity and relationship dynamics across all stages of the relationship life-cycle. Secondly, interpretations of the effects in mature and decline stages should be made with caution.

While many of the cases involved both buyer–supplier perspective of the same relationship, some of the cases studied involved only the perspective of one partner, due to lack of access to the other. Future research should focus on both buyer and supplier perspectives of the relationship.

Convenience sampling was used to identify relevant case which then led to snowball sampling of case companies; however, this was not the most efficient way to tease out findings of the cases. This could be improved in the future by using theoretical sampling. Another limitation of the sampling process was that the study only interviewed the focal firm rather than both partners, thus research could be improved in the future by dyadic or triadic data collection, especially for focal case 1. Furthermore, the research could be improved by collecting more cases and data from the buyer’s perspective.

Whilst this study focused on forming new relationships in nascent industries, a limitation was that it focused on only one sector, i.e. the OSW sector. This research could be improved in the future by sampling relationship formation in multiple different nascent industries alongside OSW.

Applying critical realism in the study did introduce some limitations as it was very difficult to deploy efficiently, due to the need for very high-quality data and it being a very time-consuming process as data would need to be revisited at multiple points over time. In order to improve external validity of the study, the critical realist approach could be enhanced by the introduction of short survey questions giving the participants the opportunity to rate the different relational elements of compatibility and complementarity as well as levels of trust, commitment and governance per stage by themselves. This could then be revisited by the researcher in order to be clarified and validated.

When coding data, the researcher chose to manually code, the limitation to this was that it was time-consuming, however it enabled the researcher to avoid errors concerned with coding software and issues with trustworthiness of the data.

Whilst research should aim for generalisability (Rosenthal and Rosnow, 1991), this study followed the research of Hennelly and Wong (2016) focussing on early stage inter-organisational relationships and did not analyse relationships in the committed or decline stage. Another limitation is that the study uses retrospective data collection. While reliability was maximised through multiple data collection techniques, the study restricted the ability to gain a micro-level understanding of events and processes. Therefore, to further elaborate on this study, real-time research is suggested. One more limitation is that the study uses retrospective data collection. While reliability was maximised through multiple data collection techniques, the study restricted the ability to gain a micro-level understanding of events and processes. Thus, to further elaborate on this study, real-time research is suggested.

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APPENDICES

Appendix one – Studies on relationship dynamics and life-cycle theory

Reference	Empirical approach	Definition of relationship stages	Relational dynamics studied	Relationship development	Relational variables across life-cycle stages
Dwyer, Schurr and Oh (1987)	Conceptual	Awareness exploration expansion commitment dissolution	Trust, Bilateral communication, goal congruence, joint satisfaction, norms	Inverted U ¹	Communication and development of norms develop trust, continued interaction, goal alignment and satisfaction. Relational constructs move in tandem through stages.
Ring and van de Ven (1994)	Conceptual	Negotiation – agreement – execution –assessment – dissolution	Trust, relational norms, idiosyncratic investment, communication, mutual dependence	Inverted U with possible cyclical iterations	“The developmental processes ... explain how cooperative [inter-organisational relationships] emerge, evolve, and dissolve over time” (p.112). Relational constructs move together through life-cycle stages.
Heide (1994)	Conceptual	Initiation – maintenance – termination	Bilateral relational governance, mutual dependence	Inverted U shape	“Governance is a multi-dimensional phenomenon, encompassing the initiation, termination and ongoing relationship maintenance between a set of parties” (p.72).
Wilson (1995)	Conceptual with ethnography findings	Partner selection – defining purpose –settling relationship boundaries – creating relationship value – relationship maintenance	Trust, social bonds, mutual dependence, satisfaction, cooperation	Linear increase	Relational constructs such as trust, social bonds, mutual goals and power/dependence issues are more important in the early stages. These constructs provide a foundation from which commitment, structural bonds and cooperation grow in later life-cycle stages.

¹ The authors find an inverted-U relationship between buyer and supplier over its evolution. According to the model peak relationship performance is found at the maturity stage. Whereas this performance quickly declines away in the dissolution stage.

Lewicki and Bunker (1996)	Conceptual	Stage 1 (calculus and deterrence-based trust) stage 2 (knowledge-based trust) Stage 3 (identification-based trust) decline	Trust, identification	Stepped increase: 'S-Shape', decline may or may not be permanent	"In professional relationships, trust develops gradually as the parties move from one stage to another" (p.124). Experience in working with partner allows trust to grow.
Rousseau et al. (1998)	Conceptual	Early stage (calculations and institutional trust) Middle/late stage (relational trust)	Trust	Trust increases linearly	"Trust changes over time – developing, building, declining, and even resurfacing in long standing relationships" (p.395).
Jap and Ganesan (2000)		Exploratory – build up – maturity – decline	Relational norms, satisfaction, commitment, bilateral investments	Inverted U shape	"The contrast in results from the total sample to the phase-by-phase analysis underscores the powerful effect of relationship context in determining key relationship outcomes, and highlights the need for tailoring interorganisational strategies according to the relationship phase" (p.241). The constructs move together through stages; however, impacts on commitment of bilateral investments, relational norms, and contracts differ across life-cycle stages.
Hibbard et al. (2001)	Cross sectional age/covariate	Quartile 1 (age = 1-96 months) Quartile 2 (97-160 months) Quartile 3 (161-236 months) Quartile 4 (237+ months)	Commitment, trust, communication, shared values, mutual dependence	Part inverted U shape, part linear decreasing trend.	The impact on relational performance of trust and communication follow an inverted U shape across life-cycle stages. The impact on relationship performance of commitment and shared values follow a linear decline.
Jap and Anderson (2007)	Cross sectional – age matched	Compared Dwyer et al.'s (1987) with Ring and Van de Ven (1994)	Information exchange, goal congruence, trust, harmony	Inverted U shape, with possibility of cyclical interactions	Most relationships follow Dwyer et al.'s (1987) predictions; however, relationships that cycle among stages have worse performance. Relational constructs: trust, goal congruence, harmony, information exchange move in concert through life-cycle stages.
Vanpoucke et al. (2014)	Cross-sectional	Compared Dwyer et al.'s (1987) with Ring and Van de Ven (1994)	Trust, knowledge exchange, interdependence commitment	Linear increase cyclical interactions	Relationships follow Dwyer et al.'s (1987) linear process; however, "once the relationship develops from the expansion into the commitment stage, a cyclical process consisting of interactive stages, i.e., negotiation, commitment and execution for each of the integration practices started to guide the subsequent integration initiatives" (p.22).

Appendix two – Coding scheme for relationship life-cycle stages

Pre-define life cycle stages ¹	Pre-defined characteristics	Efforts or triggers to move forward ²
Awareness	<ul style="list-style-type: none"> • Relationship begins • Limited confidence in partners' capability and trustworthiness • Recognize each other as "feasible" exchange partners • Could already have orders but wanting deeper relationships 	<ul style="list-style-type: none"> • Information sharing and communication • Develop relation-specific routines • Build social bonding • Identify common goals • Seek common ground • Trust
Exploration	<ul style="list-style-type: none"> • Initial levels of trust and commitment are calculative • Take more risk • Trial purchase; no commitment to long-term relationship • Evaluation of partners' capabilities and performance • Test goal compatibility • Fragile; can end easily 	<ul style="list-style-type: none"> • Exchange information (intensive) • Setup integration initiatives • Try to reduce uncertainty • Increase specific investment beyond trial purchase • Relation-specific investment • Initial levels of trust and commitment are calculative • Joint investment/ problem solving
Expansion	<ul style="list-style-type: none"> • Commit and structure resources • Growth after initial experiences are beneficial • Evidence for trustworthy judgments about partner • Increased confidence in partner • Growth after preliminary involvement seen as beneficial 	<ul style="list-style-type: none"> • Intense investment • Increased attachment and interdependence • Increased trust, satisfaction, and commitment • Satisfaction • Performance
Commitment	<ul style="list-style-type: none"> • Getting reasonable levels of satisfaction and benefits • Relational norms • Commitment • Relationship costs 	<ul style="list-style-type: none"> • Increased commitment • Knowledge based trust • Relational behaviours • Implicit/ explicit pledge of continuity • Loyalty
Dissolution	<ul style="list-style-type: none"> • Conflict • Distrust • One-way • Direct / Indirect 	<ul style="list-style-type: none"> • Withdrawal • Negotiated farewell • State-of-the relationship evaluation • Fading Away

Note: ¹According to Dwyer et al. (1987); ²Allow triggers new to existing literature

Appendix three – Coding scheme for relationship analysis

Indicator	Pre-defined characteristics	Decision rules for ensuring objectivity, validity and reliability
Information exchange	<ul style="list-style-type: none"> • Directions: one-directional; bi-directional • Willingness to share: Willing; not willing • Quality of information: 	<p>Objectivity / transparency</p> <ul style="list-style-type: none"> • For ambiguous characteristic (e.g. x vs. y), clear decision rules are defined. • All characteristics are recorded in excel spreadsheet for ensuring transparency (see appendix for summaries). <p>Validity</p> <ul style="list-style-type: none"> • All indicators & pre-defined characteristics are based on the theoretical framework & supplier- relationship management literature; • Mutual exclusiveness, independence and exhaustiveness of characteristics are ensured by the definite and indefinite categories show in this table; • Characteristic development is fine-tuned during the coding process when pre-determined categories were not exhaustive. More codes for resource bundling were later introduced. <p>Reliability</p> <ul style="list-style-type: none"> • Reliability of coding instrument is ensured by pre-defined decision rules & the use of multiple coding periods and two coders • Random cross-coding and systematic cross-coding by the two coders yielded minimal discrepancy
Trust	<ul style="list-style-type: none"> • Credibility • Benevolent • Good will • Personal • Competence 	
Commitment	<ul style="list-style-type: none"> • Loyalty • Long-term orientation • Continuation • Going ‘the extra mile’ • Satisfaction 	
Relationship quality	<ul style="list-style-type: none"> • Mutual goals • Cultural compatibility • Risk and reward sharing • Relationship satisfaction 	
Compatibility	<ul style="list-style-type: none"> • Values • Culture • Work routines • Processes • Personal relationships 	
Complementarity	<ul style="list-style-type: none"> • Product • Technology • Technical expertise • Processes • Market knowledge 	

Appendix four – Questions regarding relationship stage

Relationship Stage	Definition
Awareness Stage	Party A's recognition that party B is a feasible exchange partner
Exploration Stage	Both firms are discovering and testing the goal compatibility, integrity, and performance of the other as well as potential obligations, benefits, and burdens involved with working together on a long-term basis. The relationship between my firm and this seller is just beginning to develop
Expansion Stage	Both firms are receiving increasing benefits from the relationship and a level of trust and satisfaction has been developed such that they are more willing to become committed to the relationship on a long-term basis. The relationship between my firm and this seller is expanding and growing stronger.
Commitment Stage	Both firms have an on-going, long-term relationship in which both are receiving acceptable levels of satisfaction and benefits from the relationship. The relationship between my firm and this seller is mature and relatively stable
Dissolution Stage	One or both members have begun to experience dissatisfaction and is contemplating relationship termination, considering alternative manufacturers or customers, and is beginning to communicate an intent to end the relationship. The relationship between my firm and this seller is starting to decline.

(based on Jap (2001), Jap and Ganesan (2000) and Dwyer et al (1987))

Appendix five – Interview guide

General questions regarding business environment (Adapted from Vanpoucke et al. 2014)

- What are the competitive challenges that your business is facing today?
- What major changes in competition have you undergone in the last years?

Industry turbulence (Adapted from Fang, Palmatier, and Steenkamp 2008)

- The industry in which our firm operates is very volatile and uncertain.

Questions about customer/ supplier base (Adapted from Vanpoucke et al. 2014)

- How many customers/ suppliers do you have? (All customers/ suppliers versus key suppliers)
- Give some examples of ‘close or integrative’ relationships and a ‘not close’ relationship and additional examples of relationships that might fall between the two extremes.
- Does your company have a specific strategy for buy–sell relationships (or the broader base of suppliers/ customers)? Are there any policies?
- Why do you work with some suppliers/ customers closer together? What are determining factors? What are the trade-offs involved in these decisions?
- How are other managers in your company involved in creating supplier relationships?

Relationship age (years) (Adapted from Palmatier, 2008)

- On average, how long have employees at your firm had relationships with this seller?

Compatibility (Adapted from Sarkar et al. (2001))

- Executives from both firms involved in this project had compatible philosophies/approaches to business dealings
- The goals and objectives of both firms were compatible with each other
- The chemistry was right between the two firms
- Operational Technical capabilities of the two firms were compatible with each other
- The organizational procedures of the two firms were compatible

- Employees of both firms had similar professional or trade skills
- The organizational values and social norms prevalent in the two firms were congruent

Complementarity (Adapted from Sarkar et al. (2001))

- The resources contributed by both firms were significant in getting the bid
- Resources brought into the venture by each firm were very valuable for the other
- They contribute different capabilities to the relationship.
- They have complementary strengths that are useful to their relationship.
- They have separate abilities that, when combined together, enable them to achieve goals beyond their individual reach

Supplier Trust in the Representative (Adapted from Jap (2001))

- This representative has been frank in dealing with us,
- makes reliable promises,
- does not make false claims,
- is honest about problems that may arise,
- has made sacrifices for us in the past, cares for us,
- has gone out on a limb for us in times of shortages,
- is like a friend, and has been on our side.

Information Exchange Norms (Adapted from Heide and John (1992) and Dwyer and Oh (1987))

- In this relationship, it is expected that any information that might help the other party will be provided to them
- Information is informally exchanged in this relationship
- It is expected that we keep each other informed about events or changes that may affect the other party
- Exchange of information in this relationship takes place frequently

Bilateral Idiosyncratic Investments (Adapted from Anderson and Weitz (1992))

- We have made a substantial investment in personnel dedicated to this supplier's product line

- We have invested a great deal in building up this supplier's business
- If this relationship were to end, we would be wasting a lot of knowledge regarding this supplier's products and procedures
- If either company were to switch to a competitive buyer or supplier, they would lose a lot of investments made in the present relationship
- This supplier has invested a great deal in this relationship

Questions about the buy-sell relationship (Adapted from Vanpoucke et al. (2014))

- What type of products do you exchange?
- What kind of relationships do you have with this supplier / customer?
- Which type of information do you share with the supplier/ customer?
- Do you use structural ways of working together?
- What are the idiosyncratic assets (i.e., specific for buy-sell relationship e.g., specific procedures, technology, human assets, investments) in the relationship?
- What action plans did you do together during the last three years?
- Who was involved in these changes (e.g., cross-functional teams)?
- What was the trigger for implementing changes?
- Did you start up pilot projects? With whom did you start these up?
- Why with these partners?
- How did the buy-sell relationship evolve?
- When did the relationship start?
- How did it evolve?
- What was the reason for starting up the relationship?
- What was the initial intention of the relationship?
- What were the difficulties in setting this up? Are there disadvantages?
- How do you see this evolving in the future? What are your expectations?
- In which year did you (or your partner) do idiosyncratic investments in the relationship? Did it require a lot of negotiation? Contractual difficulties?
- What type of idiosyncratic investments did you engage in?
- What factors are involved in deciding to invest in these specific assets? What type of analysis was involved?

- How did this change the relationship in terms of trust, commitment, formality, standardization, communication (operational and strategic level), conflict resolution techniques?
- How often do you communicate? Are these communication efforts formal or rather informal? Did this change over time?
- Who initiated the decision to do the investment (initial and decision to invest) further? What was the motivation? How did one party convince the other party to participate?
- On what initiatives do you work together in the different stages?
- Are there differences in culture? Does that effect the relationship? How is it different to work with international versus local suppliers?
- How did this relationship help you to improve performance?
- What are the future perspectives?

Supplier development (Adapted from Wagner (2011))

- Our firm has undertaken supplier development with Supplier X through ...
- Giving manufacturing related advice (e.g., processes, machining process, machine set up)
- Training of employees from Supplier X
- Giving product development related advice (e.g., processes, project management)
- The transfer of employees to Supplier X
- Giving technological advice (e.g., materials, software)

Performance improvement (Wagner (2011))

- Improve our delivery reliability.
- Reduce time-to-market.
- Reduce production downtimes.
- Increase the satisfaction of our customers.
- Improve the reliability of our products.
- Improve the quality of our products.
- Offer more innovative products to our customers.

Appendix six – Data collection schedule

Participant	Participant job role	Date	Duration/location
1-0-1	Director	03/06/13	One hour five minutes (in person at work premises)
-	-	03/05/14	44 minutes (in person at work premises)
-	-	17/09/14	31 minutes (in person at work premises)
1-1-2	Key account manager	03/06/13	One hour 36 minutes (in person at work premises)
-	-	10/11/13	One hour 27 minutes (in person at work premises)
-	-	06/03/14	58 minutes (in person at work premises)
-	-	02/07/14	One hour 15 minutes (in person at work premises)
1-1-3	Key account manager and supply chain director	03/06/13	One hour 45 minutes (in person at work premises)
-	-	10/11/13	One hour 32 minutes (in person at work premises)
-	-	10/09/14	58 minutes (in person at work premises)
-	-	06/03/14	48 minutes (telephone interview)
1-1-4	Technical product manager	10/11/13	One hour 42 minutes (in person at work premises)
-	-	06/03/14	One hour 13 minutes (in person at work premises)
-	-	03/09/14	38 minutes (in person at work premises)
1-2-1	Director - UK offshore wind Industrial Strategy UK Department for Business Innovation and Skills	30/04/13	20 minutes (in person at OSW conference, UK)
-	-	26/06/13	34 minutes (telephone interview)
1-2-2	Consultant - UK Manufacturing Advisory Service	10/11/13	60 mins (in person at Leeds University campus)
1-2-3	OSW consultant	11/13/13	38 minutes (telephone interview)
1-2-4	Director - Team Humber Marine Alliance	16/04/12	15 minutes (in person at OSW conference, Denmark)
-	-	12/02/14	22 minutes (in person at OSW conference, UK)
1-2-5	Deputy Head of Renewable Energy at Department for International Trade	30/04/13	16 minutes (in person at OSW conference, UK)
-	-	19/11/13	36 minutes (telephone interview)

1-2-6	Market Intelligence Manager - Renewable UK	20/11/13	26 minutes (telephone interview)
1-2-7	Information Manager - Renewable UK	03/12/13	47 minutes (telephone interview)
1-2-8	SICO Business Development Manager UK	16/04/12	12 minutes (in person at OSW conference, Denmark)
-	-	30/04/13	16 minutes (in person at OSW conference, UK)
1-2-9	Director - Concrete gravity foundation supplier	15/10/13	36 minutes (telephone interview)
-	-	08/01/14	48 minutes (telephone interview)
2-0-1	Offshore wind operations director	12/09/13	One hour 47 minutes (in person at work premises)
-	-	13/02/14	46 minutes (in person at work premises)
-	-	11/08/14	One hour 22 minutes (in person at work premises)
-	-	12/12/14	57 minutes (telephone interview)
2-1-2	Key account manager	12/09/13	One hour 38 minutes (in person at work premises)
-	-	13/02/14	One hour 14 minutes (in person at work premises)
-	-	11/08/14	One hour 11 minutes (in person at work premises)
-	-	12/12/14	47 minutes (telephone interview)
2-1-3	Technical product manager	12/09/13	One hour 55 minutes (in person at work premises)
-	-	13/02/14	One hour 32 minutes (in person at work premises)
-	-	11/08/14	48 minutes (in person at work premises)
-	-	11/12/14	36 minutes (telephone interview)
2-1-4	Political representative	08/10/13	34 minutes (telephone interview)
-	-	12/03/14	29 minutes (telephone interview)
2-1-5	Council leader for North Lincolnshire Council (business and trade)	10/10/12	One hour 36 minutes (in person at work premises)
-	-	03/09/13	19 minutes (telephone interview)
2-1-6	Danish HQ representative	15/05/13	41 minutes (telephone interview)
-	-	11/09/13	17 minutes (telephone interview)
2-1-7	UK steel market expert	23/10/12	One hour 42 minutes (in person at work premises)
-	-	14/08/13	55 minutes (in person)

-	-	14/11/13	26 minutes (telephone interview)
2-1-8	SICO Business development manager – UK OSW market	30/04/13	15 minutes (in person at OSW conference, UK)
-	-	11/12/13	18 minutes (telephone interview)
3-0-1	OSW operations director	16/01/13	One hour 42 minutes (in person)
-	-	19/09/13	One hour 38 minutes (in person at work premises)
-	-	17/12/13	One hour 19 minutes (in person at work premises)
-	-	12/02/14	56 minutes (telephone interview)
3-1-2:	Key account manager	16/01/13	One hour 36 minutes (in person at work premises)
-	-	19/09/13	One hour 28 minutes (in person at work premises)
-	-	17/12/13	One hour 42 minutes (in person at work premises)
-	-	04/02/14	43 minutes (telephone interview)
3-1-3	Technical product manager	16/01/13	One hour 58 minutes (in person at work premises)
-	-	19/09/13	One hour 11 minutes (in person at work premises)
-	-	04/02/14	27 minutes (telephone interview)
-	-	17/12/13	One hour 39 minutes (in person at work premises)
3-1-4	Concrete centre director	11/02/13	43 minutes (telephone interview)
3-1-5:	ABCO Business development manager	04/06/13	One hour 58 minutes (in person at work premises)
-	-	18/07/13	One hour 32 minutes (in person at work premises)
-	-	15/08/13	One hour 14 minutes (in person at work premises)
3-1-6	ABCO Director	04/06/13	48 minutes (in person at work premises)
-	-	18/07/13	One hour 21 minutes (in person at work premises)
-	-	15/08/13	One hour 14 minutes (in person at work premises)
3-1-7	OSW supply chain consultant	20/03/13	One hour five minutes (in person at work premises)
-	-	12/06/13	(telephone interview)
3-1-8	GRCO commercial director	06/06/13	20 minutes (telephone interview)
-	-	27/03/13	28 minutes (telephone interview)

Appendix seven - Summary of case companies

Case	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	3.1	3.2	3.3	3.4
Focal firm	MOCO					TACO			BRCO			
Relationships	SACO	VICO	COCO	SKCO	OTCO	SICO	WTCO	MACO	GRCO	STRCO	SKANCO	BAMCO
Country	South Korea	Czech Republic	UK	Sweden	Germany	Germany	UK	UK	UK	Austria	Sweden	UK
Sector	OSW	OSW	OSW	OSW	OSW	OSW	OSW	OSW/Steel	OSW	OSW	OSW	OSW/Steel
No. of employees	11,897 (2015)	965 (2013)	250 (2014)	48,593 (2014)	800 (2014)	50,000 (2012)	50 (2014)	1,000 (2012)	1092 (2013)	76,100 (2014)	5,500 (2016)	20,370 (2014)
Revenue	£10bn (2014)	€288mn (2015)	£190mn (2015)	7.8bn SEK (2014)	€680mn (2015)	\$16.15bn (2012)	<£1mn (2013)	£40mn (2015)	£369mn (2013)	€12.38bn (2010)	£1.678bn (2016)	€6,976mn (2016)
Perspective	Supplier	Buyer	Buyer	Buyer	Buyer	Supplier	-	-	-	-	-	-
Relationship length (years)	4	6	6	10	7	4	2	4	5	3	4	3
Life-cycle stage	Early	-	-	-	-	-	-	-	-	-	-	-
New / Previous relationship	New	-	-	-	-	-	-	Priorities	New	-	Priorities	New
Sole supplier/ buyer	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No
Political and market uncertainty	High											

