

Evaluating Drivers Impacting Buyer-Supplier Relationships in Agile Supply Chain

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Abstract

This study identifies the critical drivers of buyer-supplier relationships in the context of agile supply chains. It develops a conceptual framework consisted of three higher level constructs and eleven determinants of buyer-supplier relationship. Data and information were collected through in-depth interviews from senior managers of six MNC's (buyers) and six local SMEs (suppliers) operating in electrical and electronics industry in Malaysia. AHP, a multi-criteria-decision-making methodology, was used to analyze data and access the criticality of determinants. The results indicate that SMEs regard partner's characteristics capability as the most important construct, whereas MNCs consider process capability as most important construct in building a buyer-supplier relationship. The results also indicate that the determinants such as resources complementarities and partner capabilities are more important for SMEs, whereas flexibility proficiency and information technology determinants are more important for MNCs. The findings of this study may generate ideas to manufacturers in agile environment to focus

on partner's expectations in developing a mutually beneficial relationship.

Keywords: *Agile supply chain, Buyer-supplier relationship, Multinational Corporation (MNCs), Small-medium entrepreneurs (SMEs).*

INTRODUCTION

The prime focus in supply chain management (SCM) emphasizes on the relationships between partners in the supply chain, integrating activities from the original supplier to end customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction (Mentzer et al., 2001; Hitt, Freeman & Harrison, 2008; Stock & Boyer, 2009; Piricz, 2017). Managing relationship is vital as supply chains are generally complex with numerous activities usually spread over multiple functions and organizations and sometimes over lengthy time horizons. The characteristics of the products produced and processes involved in the manufacturing process contribute to the complexity of relationships. Therefore, it is necessary to overlay a coordination system between focus members, which may include an explicit definition of processes,

responsibilities and structures aligned with overall objective of an entire supply chain.

Managing relationships between members of the supply chain are different based on whether it is an agile or lean supply chain. Organizational relationships within the agile environment are expected to become more complex (Sarkis & Talluri, 2001; Kádárová & Kalafusová, 2015). This complexity is due to the greater need for rapid integration among members of agile relationships. The complexity arises from variety of relationships and partners that will need to be managed. The worry is no longer on just managing a one-to-one relationship among a variety of organizations, but how to manage a web of partners integrated as a single organization, with the ultimate goal of a globally optimal relationship meant to address the ultimate customers' needs.

Many studies have been conducted on buyer and supplier relationship and its impact on organization performance in general (Duffy & Fearn, 2004; Houé & Guimaraes, 2017). Functional buyer-supplier relationships allow buyers to experience tailored solutions and exchange efficiencies and firms can expect better buyer insights and higher profitability (Palmatie et.al, 2013; Marcos & Prior, 2017). As reported in the Star Online dated December 16, 2016, foreign companies are attracted to invest in Malaysia because of its strong base of SMEs but require them to assess the capabilities of these SMEs before making them the global supply chain partners.

Thus, this study investigates the critical determinants of buyer-supplier relationships in the context of agile supply chains in Malaysian electronics and electrical industry considering both MNCs and SMEs perspectives and also identify the critical determinants leading to the formulation of buyer-supplier relationships in the context of agile supply chains. This paper consists of

four parts. The first section of this paper provides a brief overview of agile supply chain followed by research methodology, results and discussion and ends with conclusion.

LITERATURE REVIEW

Agile supply chain is a new strategic concept intended to improve the competitiveness of firms for innovative products. Supported by agile manufacturing, the processes are characterized by buyer-supplier integrated process for product design, manufacturing, marketing, and support services. A key characteristic of an agile organization is flexibility (Narasimhan, Swink & Kim, 2006; Darrell et. al., 2016). Agile supply chain requires enriching of the customer, co-operating with competitors, organizing to manage change, uncertainty and complexity, and leveraging people and information (Gunasekaran, 1999; Tarafdar & Qrunfleh, 2017). Changing customer and technological requirements force manufacturers to develop agile supply chain capabilities in order to be competitive. A firm's ability to respond to competitive challenges and to sustain its competitive advantage is a key element of success in today's global marketplace (Cagliano, Caniato & Spina, 2004; Tarafdar & Qrunfleh, 2017). Being responsive is an increasingly important skill for firms in today's global economy, thus firms must be agile. Using perspective that competencies are derived from capabilities, agility is a capability derived from the synergy among flexibility in the supply chain functions (Tarafdar & Qrunfleh, 2017).

A competitive advantage exists for companies that are engaged in successful long term buyer and seller relationship (Jap, 2001; Xie et.al, 2016). The literature on inter firm relationships has grown consistently over the past few years (Cousins, 2002).

Businesses have realized that in order for firms to become flexible, adaptable and efficient, they must focus their resources on managing the supply process. This approach has led firms adopt strategies such as outsourcing (Narayanan et.al, 2015), supplier delegation (Bolandifar et.al, 2016) and supplier tiering (Schuh et.al, 2017). The applications of these strategies have caused dramatic changes in the nature of the relationships between firms, from a traditionally widespread range of suppliers towards fewer suppliers and therefore a higher dependency and complex relationships (Sayuti & Sundram, 2017).

Recent studies indicate the need for shifting the view of inter-organizational relationships from arm's length to long term (Harrison & Van Hoek, 2008), collaborative relationships (Handfield & Bechtel, 2002; Narayanan et.al, 2015). A basic premise of supply chain management is that close relationships with supply chain members may give the firm and its supply chain members' competitive advantage over other supply chains by delivering superior value to the customer through reduced cost, increased quality, and superior delivery performance. A focus on relational mechanisms and micro level processes is crucial for theory development about how buyers and suppliers can move from transactional ties into commitment-based relationships and achieve gains (Carmeli & Russo, 2016).

According to Malaysia External Trade Statistic 2008, the electrical and electronics industry is Malaysia's leading industrial sector, contributing significantly to the country's manufacturing output, exports and employment. The value of output in 2008 was reported US\$53.9 billion as compared to US\$49.8 billion in 2005. From a handful of companies with less than 600 workers in 1970, the industry has today attained world-class capabilities. There are currently more

than 900 companies employing 463,616 workers. Over these years Malaysia has attracted a number of MNCs and today MNCs such as Intel, AIC semiconductor, Fuji Electrics, Infineon Technologies and BASF Electronic Materials have made Malaysia as their home (BNM, 2006). These companies are engaged in continuous process of designing and introducing variety of innovative products which have uncertain demand and therefore require a close and continuous customer contact and interaction. Due to these characteristics, integration with suppliers, manufacturers, distributors, and customers throughout the supply chain is seen as vital strategy in responding quickly to customer changing requirements (Childerhouse, Aitken & Towill, 2002; Huang, Uppal & Shi, 2002; Huang, Liang & Lin, 2009; Othman et. al., 2016). Based on a thorough literature review we identified three higher level constructs and eleven determinants (belonging to three constructs) of buyer-supplier relationships in the context of agile supply chains. These constructs and determinants are discussed below.

Partners Characteristics Capability

Partnering firms need to have different resource and capability profiles yet share similarities in their social institutions (Sarkar et al. 2001; Hui et. al., 2014). These partner characteristics are important since they help in the formation of relationship capital or the behavioral aspects of an alliance that find expression in relational dynamics such as mutual trust, commitment, and information exchange (Cullen, Johnson & Sakano 2000; Sanda et.al., 2015). The partner characteristics capability can be operationalized in terms of four determinants (Partner Compatibility, Goal Congruence, Corporate Reputation, and Resources Complementarities). Partner Compatibility as stated by Pansiri (2008) observes that like relationships between

people, organization relationships begin with courtship, where organizations attracted to each other seek to discover their compatibility. This is ranked as one of the main ingredients for a successful alliance because the sophistication and expression of the strategy will not work if relationship is not workable.

Further, a successful alliance must be based on goal congruence or compatible goals (Wang et.al, 2016). According to Wang et.al (2016) clarity of focus is vital, ambiguous goals, fuzzy directions, and uncoordinated activities are the primary causes of failure of cooperative ventures. To avoid the pitfall of ambiguity or different goals, partners should make sure they have synchronous goals to begin with, and then review what has been accomplished in terms of their original goals. Another critical factor identified by Al-Khalifa and Peterson (1999) in international joint venture (IJV) partner selection criteria is related to reputation of the alliance partners. Corporate reputations increase investors' confidence that firms will act in ways that are reputation-consistent. Strategy scholars see reputation as assets as well as mobility barriers (Rose & Thomsen, 2004; Xie et.al, 2016). Established reputations impede mobility and produce higher returns to firms because they are difficult to imitate (Barney, 2001). Finally, effective inter-organizational alliances are associated with the selection of appropriate partners since choosing partners who possess necessary resources and with whom strategic and economic incentives can be aligned is a critical determinant of partnering success (Sarkar et al., 2001; Wang et.at, 2016). Wang et.al, (2016) suggests that performance is likely to be enhanced when firms are able to manage the paradox involved in choosing a firm that is different, yet similar. Thus complementary resources and capability profiles enhance the

value generated in alliances, as do similarity in the social institutions of the partners.

Alliance Management Capability

The management of alliances is a difficult organizational activity due to the complexities and uncertainties inherent in managing activities across organizational boundaries. It may be particularly salient for high technology organizations where they often need to rely on extensive inter-firm cooperation in developing new products (Rothaermel & Deeds, 2006; Jie et. al, 2016). The determinants of alliance management capability constructs are commitment, trust, cooperation and conflict management. A high level of commitment provides a context in which both parties can achieve their individual and joint goals without raising the spectra of opportunistic behavior (Graca et.at, 2015). Graca et al. (2015) refer commitment as the willingness of trading partners to exert effort on behalf of the relationship that can be sustained in the face of unanticipated problems. It suggests a future orientation in which partners attempt to build a relationship that can weather unanticipated problems. In other words, partnering relations are considered from a long term perspective.

In strategic alliance, when knowledge is exchanged, firms have two options: they can try to protect themselves with contracts or they can resort to trust (Hitt, Freeman & Harrison, 2008; Xuan Bai et.al, 2016). Inter-organizational trust and relationship-specific assets are sources of relational capabilities and thus enable successful buyer-supplier performance (Rapeeporn et.al, 2017). Trust plays a key role in any organizational relationship (Sanda et.al, 2015). The need for trust between partners has been identified as an essential element of buyer-supplier relationships (Cullen, Johnson & Sakano 2000: Sanda et.al, 2015). In

addition organizations are forming partnerships to enhance their capabilities to improve product quality, innovation and market reach (Duffy & Fearn 2004; Whipple et.al, 2015). Whipple et.al (1994) suggest that organizations cannot develop enduring competitive advantages without working cooperatively with their suppliers and distributors. Conflict Management is vital as conflict is inevitable in buyer-supplier relations as a consequence of two firms trying to maximize their returns from the business relationship (Graca et.al, 2015). The increasing overall level of disagreement has arose the need of managing conflict between trading partners.

Process Capability

Supply chain is a network of operating processes while network is viewed as a system of business processes. Nesting the capabilities of these processes creates power and synergy for the network. If different links in the supply chain are directed towards different competitive priorities, then the chain will not be able to serve the end-customer (Harrison & Van Hoek 2008). The process capability can be defined in terms of information technology, innovation, and flexibility proficiency determinants. The backbone of the supply chain business is Information Technology (IT) which is used to acquire, process, and share information among supply chain partners for effective decision making (Graca et.al, 2015). The information systems and technologies in supply chains represent one of the fundamental elements that link the organizations of a supply chain into unified and coordinated system (Kochan et. al., 2018). Innovation is a new way of doing something or “new stuff that is made useful” (McKeown 2008).

In the organizational context, innovation may be linked to performance and growth

through improvements in efficiency, productivity, quality, competitive positioning and market share (Guan & Ma 2003). From a resource-based view of the firm, innovative capability, among other capabilities, is seen as critical to a firm achieving strategic competitiveness (Battisti & Deakins, 2017). Flexibility proficiency is defined as increasing the range of products available, improving the firm’s ability to respond quickly, and achieving good performance over a wide range of products. From a general point of view, flexibility is a capability of adaptation/change (De Toni & Tonchia 2005). Firms are required to increase its adaptation capability to respond to demand changes. Based on the above discussion we suggest a conceptual framework to assess the critical constructs and determinants of buyer-supplier relationships in the context of agile supply chains. The framework consists of three higher level constructs and eleven determinants. It is shown in Figure 1.

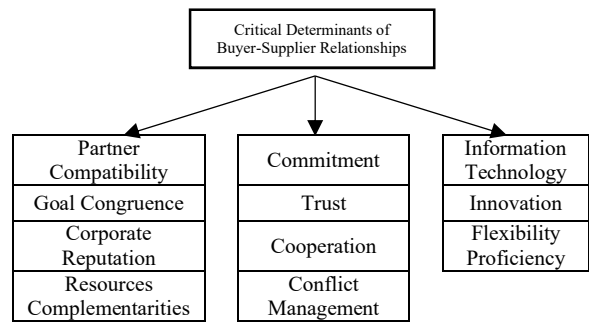


Figure 1: Structure of AHP Model of Agile Supply Chain in Buyer and Supplier Relationship

METHODOLOGY

This research employs Analytical Hierarchy Process (AHP) using Expert Choice software as analysis method. It is a multi-criteria decision making methodology that assists the decision maker facing a complex problem with multiple conflicting and subjective criteria in diverse decision-

making situations (Saaty, 1990). AHP is a suitable approach for undertaking quantitative as well as qualitative analysis (Saaty 1994), however, there are two major limitations of the methodology. The first limitation is its assumption of independency among various criteria of decision making which makes it difficult to assess the correlations among criteria. The second limitation of AHP is its use of crisp judgments for pair-wise comparisons between criteria. The traditional AHP employs a scale with exact numbers between 1-9 (Saaty, 1980). Since much decision making involves some uncertainty, the use of fuzzy numbers and linguistic terms is more suitable and a more natural way of dealing with preferences instead of exact values.

The steps involve in the modeling of AHP are:

1. Structuring the problem as a hierarchy thus building the AHP model
2. Collection and compilation of decision makers' opinions and application of priority procedures. The scale of absolute values of 1-9 is used for making the pairwise comparison judgments (Table 1).
3. Identifying determinants of buyer and supplier relationship through synthesis of normalized priority weights
4. Checking inconsistency of opinions of decision makers.

Table 1: 1-9 Scale with Verbal Description of Judgment

Value	Judgment	Verbal description of judgment
1	Equally important	Two alternatives shares the same level of importance
3	Moderately more important	Experience and judgment slightly favors one alternative
5	Strongly more important	Experience and judgment strongly favors one attribute over another
7	Very strongly more important	Experience and judgment tell that one alternative is much more important than the other
9	Extremely more important	The difference of importance is extreme
2, 4, 6, 8	Intermediate values between the two adjacent	Used if more precision is needed

Twelve in-depth interviews were conducted with senior managers in six selected SMEs and senior managers of six MNCs. These companies are located in Selangor, the central region of Malaysia, and they have been contributing significantly to the growth of Malaysian electrical and electronics industry. The senior managers selected were from the department of procurement, operations, logistics and supply chain management and play significant roles in decision making processes in their own companies. The names of these managers were supplied through researcher's networking. Researcher personally contacted the respondents who specified their willingness to participate in the interview.

The interview questions were emailed to them prior to the interview day as to secure their understanding on the research objectives. Times of interview for all respondents were arranged according to the respondent's availability and were conducted at the respondent's workplace. Researcher started the interview with a brief explanation on the research objectives, ethical approval and confidentiality of the study. The respondents were briefed on the procedure and what is required in AHP methodology. To capture the respondent understanding on the interview questions, researcher went through every question with the respondent. Further clarification was given when researcher was asked about the questions. The respondents' profile is depicted in Table 2.

Table 2: Respondent and Organization Related Information

Respondent	Respondent's Related			Organization Related	
	Respondent's Position	Education Level	Experience in electrical and electronic	No of Employee*	Operation Years
SME1	Senior Manager	Graduate	8 years	15 - 150	8 years
SME2	Head of Department	Graduate	13 years	15 - 150	13 years
SME3	Senior Manager	Graduate	0	15 - 150	13 years
SME4	Head of Department	Graduate	13 years	15 - 150	> 30 years
SME5	Head of Department	Diploma	8 years	20 - 50	4 years
SME6	Head of Department	Graduate	8 years	20 - 50	> 30 years
MNC1	Director	Postgraduate	>16 years	501 - 1000	> 30 years
MNC 2	Head of Department	Postgraduate	8 years	501 - 1000	8 years
MNC 3	Head of Department	Postgraduate	8 years	501 - 1000	> 30 years
MNC 4	Head of Department	Postgraduate	13 years	501 - 1000	> 30 years
MNC 5	Head of Department	Postgraduate	13 years	501 - 1000	> 30 years
MNC 6	Head of Department	Postgraduate	8 years	501 - 1000	26 years

RESULT AND DISCUSSION

The analysis was done separately for SMEs and MNCs. Table 3 presents the results from the AHP analysis. The results indicate that five out of six SMEs ranked the ‘partner’s characteristics capability’ as the most important construct for buyer-supplier relationships between SMEs and MNCs in

the context of agile supply chain in Malaysian electrical and electronics industry. The preference weights for partner’s characteristics capability are relatively high and varied between 0.33 and 0.67. Consistency Indices (CI) ranged between 0.0 (SME 5 and SME 6) and 0.08 (SME1, SME2 and SME3) indicating an acceptable level of consistency of judgment (acceptable level $CI \leq 0.1$) (Saaty 1994).

On the other hand, four out of six MNCs ranked the ‘process capability’ construct as the most important construct for buyer-supplier relationships. The preference weights for ‘process capability’ construct are relatively high which varied between 0.64 and 0.73. Consistency indices are found to be within the acceptable level (ranged between 0.0 and 0.09). Although SMEs and MNCs differed in ranking the most critical construct for buyer-supplier relationships, they however, are consistent in identifying the least important construct. Five out of six SMEs and four out of six MNCs ranked ‘alliance management capability’ as the least important construct in building a buyer-supplier relationship.

Table 3: Ranking of Constructs of Buyer-Supplier Relationships (Level 1)

	SME 1		SME 2		SME 3	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight	
Partner's Characteristics Capability	0.674	Partner's Characteristics Capability	0.627	Partner's Characteristics Capability	0.627	
Process Capability	0.226	Process Capability	0.279	Process Capability	0.280	
Alliance Management Capability	0.101	Alliance Management Capability	0.094	Alliance Management Capability	0.093	
Consistency Index (CI)	0.08	Consistency Index (CI)	0.08	Consistency Index (CI)	0.08	
	SME 4		SME 5		SME 6	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight	
Partner's Characteristics	0.487	Partner's Characteristics	0.333	Partner's Characteristics	0.455	

MNC 1		MNC 2		MNC 3	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Partner's Characteristics	0.731	Partner's Characteristics	0.674	Partner's Characteristics	0.747
Process Capability	0.188	Process Capability	0.226	Process Capability	0.134
Alliance Management	0.081	Alliance Management	0.101	Alliance Management	0.119
Consistency Index (CI)	0.06	Consistency Index (CI)	0.08	Consistency Index (CI)	0.01
MNC 4		MNC 5		MNC 6	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Partner's Characteristics	0.635	Partner's Characteristics	0.717	Partner's Characteristics	0.333
Process Capability	0.287	Process Capability	0.195	Process Capability	0.333
Alliance Management	0.078	Alliance Management	0.088	Alliance Management	0.333
Consistency Index (CI)	0.09	Consistency Index (CI)	0.09	Consistency Index (CI)	0

Table 4 provides a summary of the AHP analysis for the determinants of buyer-supplier relationships (2nd level of AHP model). The overall Consistency Index for SMEs varied between 0.03 and 0.8 and for MNCs ranged from 0.05 to 0.11. In both the cases CIs are within the acceptable level. The results show that the 'resource complementarities' determinant is

considered as the most important determinant by three SMEs with weights ranging between 0.15(SME5) and 0.389 (SME2). The other three SMEs considered partner compatibility (SME3), Information Technology (SME4) and Flexibility Proficiency (SME6) with weights of 0.274, 0.209 and 0.221 respectively. Since determinants such as the resource complementarities and partner compatibility are the components of the partner's characteristics capability construct, thus indicates that these findings are generally consistent with the findings of the 1st-level analysis. It is important to highlight that four out of top five determinants are common for all SMEs except for SME5. These determinants are resource complementarities, partner compatibility, flexibility proficiency, and innovation.

In the case of MNC, analysis indicates that four out of six MNCs ranked flexibility proficiency as the most critical determinant for defining the buyer-supplier relationships in the context of agile supply chain. Since flexibility proficiency is one of the components of the process capability construct which means that results at 2nd level is consistent with the results at the 1st level of the hierarchy. Four out of five top determinants are common for all MNCs except for MNC2.

Table 4: Ranking of Determinants of Buyer-Supplier Relationship (Level 2)

SME 1		SME 2		SME 3	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Resources	0.378	Resources	0.389	Resources	0.274
Complementarities	0.15	Complementarities	0.15	Complementarities	0.209
Partner Compatibility	0.1	Partner Compatibility	0.1	Partner Compatibility	0.221
Trust	0.1	Trust	0.1	Trust	0.0
Conflict Management	0.069	Conflict Management	0.069	Conflict Management	0.0
Information	0.0	Information	0.0	Information	0.0

n	63	n	42	n	41
Technology		Technology		Technology	
Consistency Index (CI)	0.06	Consistency Index (CI)	0.08	Consistency Index (CI)	0.03
SME 4		SME 5		SME 6	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Resources Complementarities	0.209	Resources Complementarities	0.15	Resources Complementarities	0.21
Partner Compatibility	0.209	Partner Compatibility	0.35	Partner Compatibility	0.198
Trust	0.192	Trust	0.29	Trust	0.159
Conflict Management	0.181	Conflict Management	0.18	Conflict Management	0.133
Information Technology	0.07	Information Technology	0.11	Information Technology	0.107
Consistency Index (CI)	0.04	Consistency Index (CI)	0.03	Consistency Index (CI)	0.04
MNC 1		MNC 2		MNC 3	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Resources Complementarities	0.528	Resources Complementarities	0.298	Resources Complementarities	0.436
Partner Compatibility	0.150	Partner Compatibility	0.265	Partner Compatibility	0.21
Trust	0.082	Trust	0.095	Trust	0.101
Conflict Management	0.070	Conflict Management	0.086	Conflict Management	0.075
Information Technology	0.053	Information Technology	0.069	Information Technology	0.062
Consistency Index (CI)	0.08	Consistency Index (CI)	0.09	Consistency Index (CI)	0.05
MNC 4		MNC 5		MNC 6	
Ranking Factor	Weight	Ranking Factor	Weight	Ranking Factor	Weight
Resources Complementarities	0.115	Resources Complementarities	0.24	Resources Complementarities	0.219
Partner Compatibility	0.128	Partner Compatibility	0.35	Partner Compatibility	0.13
Trust	0.116	Trust	0.079	Trust	0.12
Conflict Management	0.104	Conflict Management	0.063	Conflict Management	0.086

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Information Technology	0.062	Information Technology	0.058	Information Technology	0.078
Consistency Index (CI)	0.11	Consistency Index (CI)	0.08	Consistency Index (CI)	0.08

CONCLUSION

This study develops a conceptual framework as a hierarchy consisted of three higher level constructs and eleven determinants of buyer-supplier relationships as displayed in Figure 1. It investigates the critical constructs and determinants of buyer-supplier relationships between MNCs and local SMEs in the context of agile supply chains in Malaysian electrical and electronics industry. The information gathered from the senior managers through in-depth interviews of both MNC and SME operating in electrical and electronics industry in Malaysia. AHP, a multi-criteria decision-making methodology, was used to analyze data and assess the criticality of determinants. The results indicates that SMEs regard partner’s characteristics capability as the most important construct, whereas, MNCs consider process capability as most important construct in building a buyer-supplier relationship. The results also indicate that the determinants such as resource complementarities and partner compatibility are more important for SMEs, whereas, flexibility proficiency and information technology determinants are more important for MNCs. The results provide insights and ideas on the development of mutually beneficial relationship in responsive market. It provides a framework to assist policy makers and decision-makers in exploiting and strengthening their own organizational capabilities, mainly partner’s characteristics capability and process capability.

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