

Relational architecture and relational capability: organisational levers to support strategic supplier relationships

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RELATIONAL ARCHITECTURE AND RELATIONAL CAPABILITY:
ORGANISATIONAL LEVERS TO SUPPORT STRATEGIC SUPPLIER RELATIONSHIPS

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Abstract

The resource based view of strategy suggests that competitiveness in part derives from a firm's ability to collaborate with a subset of its supply network to co-create highly valued products and services. This relational capability relies on a foundational intra and inter-organisational architecture, the manifestation of strategic, people, and process decisions facilitating the interface between the firm and its strategic suppliers. Using covariance-based structural equation modelling we examine the relationships between internal and external features of relational architecture, and their relationship with relational capability and relational quality. This is undertaken on data collected by mail survey. We find significant relationships between both internal and external relational architecture and relational capability and between relational capability and relational quality. Novel constructs for internal and external elements of relational architecture are specified to demonstrate their positive influence on relational capability and relationship quality.

Keywords: relational architecture, relational capability, relationship quality, strategic suppliers, social network theory.

1. Introduction

The strength and quality of a firm's relationships with trading partners can be a source of distinctive value creation (Morgan and Hunt, 1994; Day et al., 2013). As the relational view posits, strong inter-organisational relationships provide access to information, ideas, products, technologies, and process innovation residing in a firm's network (Gulati, 1998; Dyer and Singh, 1998; Madhok, 2002; Fawcett et al., 2007; Hanghøj and Mols, 2015). As such, relational quality is fundamental to the financial success of alliances and cooperative networks (Dwyer et al., 1987; Lavie, 2006; Elfenbein and Zenger, 2014). Unfortunately, although evidence shows that collaborative relationships are beneficial in several contexts, extant research indicates that processes needed to govern relationships—i.e., establish relational capabilities and build relational capital—are not easily mastered (Cousins and Spekman, 2003; Barringer and Harrison, 2000; Fawcett and Magnan, 2002; Spekman and Carraway, 2006). The need to explore how to govern strong, collaborative relationships remains relevant and timely.

Nadler et al. (1992:15) ascribe the principles of architecture—purpose, fit, materials, and technologies—to organisations, defining organisational architecture (OA) as the “art of shaping organisational space to meet human needs and aspirations”. They posit that OA integrates diverse systems to enable capability development. Jacobides (2006) recognised the key role of OA in relational governance, suggesting that shifting organisational boundaries can catalyse changes in division of labour among firms. Indeed, Jacobides (2006: 159) captured the essence of relational capability, asking, “How does the inter- or intra-organisational architecture affect our ability to ‘find new recipes,’ go into ‘the great unknown’?” Jacobides calls for more research into the relationship between architecture and capabilities.

We seek to explore whether the notion of architecture in the context of buyer/supplier relationships provides insight into how companies effectively establish a relational capability. Specifically, we argue that by investing in relational architecture—i.e., governance skills—managers can shape positive and proactive exchange environments thereby gaining access to the complementary resources residing among trading partners (Amaral et al., 2011; Lorenzoni and Lipparini, 1999; Madhok, 2002; Lavie, 2006; Weigelt, 2009). We further posit that the relationship between buyer and supplier is influenced by core OA elements, including strategy (e.g., firm boundary and division of labour), organisational structure (e.g., cross-functional and cross-organisational teams), processes (e.g., information exchange, design), people (e.g., functions and individuals), and culture (e.g., collaborative).

This article therefore enriches and tests theory regarding how investments in relational architecture influence a firm's relational capability and whether any enhancement of the quality of a firm's critical trading relationships occurs. Despite growth in the volume of work supporting the relational view (e.g., Lavie, 2006; Cousins et al., 2006; Zacharia et al., 2009; Chatain, 2010; Handley, 2012), governance research is needed since few studies examine the organisational and relational architecture choices driving the development of a relational capability. Chatain (2010) and Sirmon et al. (2011) suggest it is now important to assess how firms develop the relational capital necessary to accomplish strategic goals they cannot achieve on their own.

2. Theoretical Development: Architecture as Governance

A growing pool of research supports the position that collaborative inter-organisational relationships improve competitive performance (Dyer, 1997; Lorenzoni and Lipparini, 1999; Carr and Pearson, 2002; Allred et al., 2011; Cao and Zhang, 2011). Scholars observe changes in the supply function that reflect an increasingly strategic role for key supplier relationships

(Cousins and Spekman, 2003; Tan et al., 2002), noting the importance of enhanced communication, a long-term orientation, and segmented relationships (Chen et al., 2004; Li et al., 2014). For example, firms continue to grow outsourcing as an approach to focus resources (Holcomb and Hitt, 2007), reduce costs (Shin et al., 2000), and access knowledge and innovation (Wagner, 2012). Of course, the nature of a supply relationship should be contingent on elements such as factor market structure (Dierickx and Cool, 1989), strategic importance (Cousins and Spekman, 2003; Carr and Pearson, 2002), and transaction costs (Bensaou, 1999). Deep collaboration gets reserved for relationships when they possess high value co-creation potential (Fawcett et al., 2012; Kar and Pani, 2014).

Less tangible than the operational and financial benefits of strong organisational relationships is social capital, which generally refers to accumulated goodwill (Adler and Kwon, 2002). A similar construct, relational capital, “refers to the level of mutual trust, respect and friendship arising out of close interaction at the individual level between alliance partners” (Kale et al., 2000: 218). Developing greater relational capital grants access to actual and potential resources embedded in networks and is linked with performance improvements (Collins and Hitt, 2006; Krause et al., 2007; Lawson et al., 2008). These perspectives present social and relational capital as resource stocks (Dierickx and Cool, 1989) to be nurtured and developed for the purpose of leveraging the value residing in network resources (Amit and Schoemaker, 1993; Lorenzoni and Lipparini, 1999). Developing exchange environments engendering collaboration with strategic partners—affected by a firm’s relational architecture—is paramount to successful relationships and building relational capital (Gulati and Kletter, 2005).

2.1 Resources and Organisational Capabilities

In discussing the resource-based view (RBV), Barney (1991) notes that resources and capabilities are components of imperfect imitability and manifest as socially complex phenomena. Positive reputation among suppliers and interpersonal relations among managers are examples of these phenomena. Dynamic capabilities are bundles of “the organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die” (Eisenhardt and Martin 2000: 1107). Zollo and Winter (2002: 310) underscore learning and renewal by claiming a capability is a “learned and stable pattern of collective activity through which the organisation systematically generates *and* modifies its operating routines in pursuit of improved effectiveness”.

In their review and critique of the RBV, Kraaijenbrink et al. (2010) point to a weakness in the development of resource-based theory (RBT), noting an inadequate definition and demarcation among the wide variety of resources (e.g., capabilities) implied by the theory. They suggest improving RBT requires more clarity in distinguishing between building/acquiring a *capacity* (including both resources and capabilities) and the managerial processes to *deploy* the capacity. Finally, they critically determine that too much of empirical RBV research places resources and capabilities as independent variables and measures of performance as dependent variables, and therefore becomes silent about how firms develop and deploy capabilities. We take this critique into account by exploring the organisational levers supporting the micro-foundations of relational capability—the how—as well as investigating the outcomes of capability deployment.

2.2 The Nature of a Relational Capability

Grant's (1996) conception of an "architecture of capabilities" suggests that higher-order capabilities are developed only through integrating knowledge at lower levels of a capability hierarchy, making them difficult to imitate and therefore a source of advantage. Examples of higher-order capabilities include a firm's ability to effectively execute post-acquisition integration processes (Zollo and Winter, 2002) and organized methods to share information in a way that leads to high-level value co-creation (Fawcett et al., 2011). Similarly, we consider relational capability to be a higher-order capability, as it requires the structure and processes to identify complementary resources, the social skills necessary to develop trust, and the technical skills to integrate knowledge across multiple organisations and functions (Lintukangas, 2011). Developing and managing inter-organisational relationships is a process (Dwyer et al., 1997), mirrored by the routines involved in creating and improving relational capability (Cousins et al., 2006; Ring and Van de Ven, 1994). We therefore define a relational capability as,

A firm's ability comprising intra- and inter-organisational routines to continuously and systematically access, enhance, integrate, and reconfigure network resources and capabilities to achieve differential advantage.

Noting the challenges of building a relational capability and the dearth of research addressing how inter-organisational relationships are managed, Barringer and Harrison (2000) conclude that, "making business partnerships work is a fragile balance of competing forces."

2.3 Organisational and Relational Architecture

Simon (1962) explains that complex systems consist of a "large number(s) of parts that interact in a non-simple way" (1962: 468) and can be decomposed. Nadler, et al. (1992), for instance, decompose organizational architecture into the sub-systems of structure, processes, information flow, and values. Jacobides (2006) similarly implies relational architecture (RA) comprises organisational structure, division of labour, resource allocation mechanisms, and inter-

organizational coordination (e.g., communication processes, metrics and rewards, and culture). Strategic and design decisions in RA are critical to a firm's relational capability. Noting the lack of research in this area, Jacobides (2006: 156) states, "What has not been well-articulated to date is the way in which this division of labour relates to the capabilities of organisations and to the ways in which these capabilities change and evolve."

Fjeldstad et al. (2012) suggest that new collaborative models utilise architectural principles of computing systems and include actors that can self-organise as well as a commons - a location where actors congregate and share resources. Finally, Gulati and Singh (1998) note that decisions regarding organisational architecture, including division of labour and the decomposing of tasks, will drive coordination costs. Their "architecture of cooperation" includes a variety of coordination controls such as contracts, incentive structures, and dispute resolution procedures. They remind us of Litwak and Hylton's (1962: 399) observation that inter-organisational relationships have an added challenge "since there is both conflict and cooperation and formal authority structure is lacking."

3. Model and Hypotheses

We have so far noted that relational architecture (RA) provides the foundation on which relational capabilities and positive inter-organizational exchange are developed. RA thus enables the routines needed to access resources residing outside firm boundaries, which may be combined with a firm's own resources to create relational rents (Collins and Hitt, 2006). Gavetti and Levinthal (2000: 113) suggest that "routines reflect experiential wisdom . . . and the selection and retention of past behaviors." Leiblein and Miller (2003: 846) apply this thinking to routines in sourcing and the development of relational capabilities:

Greater sourcing experience is likely to aid in the development of organisational routines that allow firms to efficiently collaborate with a broad array of partners. These routine-based capabilities may include general capabilities such as standard contractual safeguards or mechanisms to enhance interfunctional coordination across partners as well as firm-specific relational capabilities. Experienced firms may select better suppliers, understand how to organise relationships more effectively, and better anticipate and respond to technological or market contingencies over time.

We posit that experienced and mature firms have designed and developed relational architectures that lead to better outcomes. Through learning, they alter elements of relational architecture—structure, processes, people, technology, resource allocation, and metrics—enhancing their capability to manage strategic supply relationships. This relational capability manifests in higher quality relationships. Relationship quality reflects relational capital, the “stock” that motivates partners to invest time, energy, and creativity in a relationship (Hutchinson et al., 2012). Figure 1 portrays the architecture/capability/quality sequence.

—Insert Figure 1 here—

Theoretical Model: Connections between Architecture, Capability, and Relationship

In a meta-analysis of relationship marketing, relationship quality emerged as the strongest driver of tangible outcomes (Palmatier et al., 2006). Generally treated as a multi-dimensional construct, relationship quality’s primary dimensions are strikingly similar to social and relational capital, all including trust, commitment, and relationship satisfaction (Dorsch et al., 1998 and Skarmeas et al., 2008). Other elements of relationship quality include customer orientation (Dorsch et al., 1998), understanding (Leonidou et al., 2006), expectations of continuity, and willingness to invest (Jap et al., 1999). The social factors characterising exchange relationships (e.g., trust, obligation, and relational norms) are critical as they affect partners’ willingness to contribute valuable resources (Bernaedes, 2010). The connection between relational capability and relationship quality provides the foundation for our first hypothesis:

Hypothesis 1: *Organisations possessing a mature relational capability will achieve higher levels of relationship quality with strategic suppliers.*

3.1 The Role of Relational Architecture

Jacobides' (2006) research program on organisational architecture and capability development starts with structure; that is, the division of labour within and among organisations. Boundary decisions therefore shape the capabilities and resources developed by the firm (Jacobides, 2005). As organisations increase levels of outsourcing (Gulati and Kletter, 2005; Holcomb and Hitt, 2007), they change their boundaries and become more reliant on supply network for resources and capabilities (Slowinski et al., 2009; Weigelt, 2009). Examining which elements of relational architecture are most important for developing a relational capability, especially with strategic suppliers, is a natural progression.

We suggest an organisational system responsible for managing inter-organisational relationships has a hierarchy, one that can be decomposed into the components that define a firm's relational architecture. When addressing complex relationships, Litwak and Hylton (1962) recommend distinguishing the intra-organisational and inter-organisational elements. As such, we distinguish the RA decisions that affect internal routines and policies (i.e., internal relational architecture) from those affecting external, boundary spanning routines and processes (i.e., external relational architecture). The elements of internal and external relational architecture provide the foundation on which a firm's relational capability is developed and nurtured.

3.1.1 Internal Relational Architecture

Building the relational routines necessary to identify high-performing suppliers, develop collaboration opportunities, and build trust requires high levels of internal organisational

commitment and resource dedication (Ring and Van De Ven, 1994; Leiblein and Miller, 2003). Such commitment emerges when a firm recognises the value-creation potential embedded within the supply network and elevates supply management to a strategic position. Indications of this commitment include creating organisational units focused on supply relationships, assigning executive sponsors, dedicating relationship leaders, and building cross-functional supply management teams (Krause et al., 2007)

Internal relational architecture also reflects the decision frameworks (e.g., policies, processes, and measures) a firm develops and maintains (Feldman and Pentland, 2003). For example, contracts characterize governance policies and define relationships. Lusch and Brown (1996) find that normative contracts (those that suggest mutual understanding) positively relate to both relational behavior and improved performance. Li et al. (2010: 355) demonstrate that contracts can “reduce cognitive and coordination barriers and thus strengthen the impact of relational mechanisms on knowledge acquisition.” Adjusting contracts to engender trust—particularly in the case of buyers seeking access to critical resources in their networks—is a vital element of internal relational architecture.

Further, world-class supply management organisations document the supply process and the outcomes of diverse relationship strategies (Olsen and Ellram, 1997). They also undertake performance assessments to give insight into the return on investment of close ties with strategic suppliers (Chen et al., 2004). Such analysis justifies trust-building initiatives such as the sharing of benefits with suppliers (Cousins et al., 2006). In turn, trust helps access and integrate critical external resources (Lavie, 2006; Weigelt, 2009). For instance, integrating supplier resources into design activities benefits buying and supplying firms (Chen et al., 2004; Carr and Pearson, 2002). Ettlie and Pavlou (2006) also find that relational capabilities positively affect new product

development and commercialisation, but in our definition, the integrative aspect is itself an element of internal architecture. As investments in internal relational infrastructure are strongly associated with improved supply performance (Dyer, 1997; Wu, et al., 2006), we posit:

Hypothesis 2: *Internal relational architecture decisions—restructuring contracting policies and incentives, policies to jointly reduce costs, performance metrics, integrating suppliers into product development and the use of continuous improvement processes—positively affect the level of relational capability.*

3.1.2 External Relational Architecture

The role played by external RA is a shaping capacity in the inter-organisational space where relational exchanges occur. Appropriate external architecture aligns relationship governance structures with the characteristics of the purchase. Creating joint value-added processes, conducting performance evaluation at multiple levels, and understanding the effects of supplier strategies and capabilities are examples of routines in external RA.

Timely access to and analysis of accurate information is vital to supplier evaluation to keep check on the hazards of cooperative behaviour, enabling closer fit between relationships and governance modes (Krause et al., 2007). Evaluation and feedback requires capable internal data and measurement systems as well as more frequent, open, and honest communication with suppliers (Lawson et al., 2008). Specifically, feedback on performance increases transparency and can focus attention and resources on areas of improvement. When strategic information—e.g., evaluation criteria and performance results—is communicated, both relationship quality and performance improves (Lorenzoni and Lipparini, 1999, p. 332). In the context of innovation sourcing, Linder et al. (2003) suggest that contractual agreements can address the more tangible objectives (e.g., financial goals), but areas that address culture, workspaces, and information flows require more high-touch mechanisms such as trust (Kar and Pani, 2014).

Cognition in relationships and networks includes understanding the implications of supplier strategies (Bernades, 2010) and is driven through upper-level meetings and conversations regarding performance and plans. Better relations enhance supplier development efforts and allow firms to work more effectively together to improve underlying routines and essential value-creation processes (Collins and Hitt, 2006; Carr and Kaynak, 2007; Krause et al., 2007). Both parties are more willing to contribute energy and creativity to improvement and joint problem solving (Saccani and Perona, 2007). Importantly, close relationships provide the time and space necessary for learning how to work together, increasing both the need and desire to share information (Carr and Pearson, 2002). Lorenzoni and Lipparini (1999: 332) observe symbiosis in this relationship, noting, “Inter-firm ties are enhanced over time by the creation of a sense of community and trust, daily activity in knowledge access, and co-design practices.” We therefore posit:

Hypothesis 3: *External relational architecture decisions (involving information sharing, strategic planning, executive reviews and joint process improvement) positively affect the level of relational capability.*

To summarise, relational architecture shapes the behavioural, cultural, and structural factors configuring inter-organisational space. By leveraging the accumulated experience of inter-organisational relationships, relational architecture decisions and behaviours shape the firm’s relational capability and determine its ability to cultivate the high-quality relationships needed to access, enhance, and integrate network resources (Dyer and Singh, 1998; Madhok and Tallman, 1998; Lorenzoni and Lipparini, 1999).

4. Methods

Issues involving relational architecture, capability, and capital are boundary spanning, nuanced, and not well understood, so any research design requires scale specification and survey

administration. To firmly ground the research and provide the context for construct development we detailed the thorough literature search to provide the insight needed to design the survey and define the population from which to sample. We employed structural equation modelling (SEM) to validate the model and evaluate the hypotheses and used the AMOS 4.0 software program.

4.1 Sample Frame and Data Collection

Gaining an understanding of relational architecture requires the careful and consistent selection of the survey's key informants. Because the constructs of interest (relational architecture and capability development) and the unit of analysis (strategic supplier relationships) involve collaborative interactions and broad organisational accountability, we identified directors and vice-presidents as the appropriate key informants. Such individuals also possess an understanding of overall firm-level performance.

Two professional associations with a strong European presence—the International Procurement Leadership Foundation (IPLF) and the Council for Supply Chain Management Professionals (CSCMP)—helped compile a mailing list consisting of their senior-level executives. The entire membership of the IPLF was combined with a randomly selected group of 2,000 CSCMP members. Such an approach to defining the sampling frame is found to be robust by other studies (e.g. Carr and Pearson, 2002).

The survey process followed Dillman's (2000) Tailored Design Method. We contacted respondents by email on three separate occasions. The first email (including a link to the questionnaire) was followed up with two reminders (each sent two weeks apart representing a total data collection period of seven weeks in duration). A total of 3,099 questionnaire completion requests were sent via email, with 809 being returned. However, because the survey was lengthy (we included a number of questions as part of a self-assessment benchmarking

profile to motivate participation), a number of incomplete surveys were returned. The survey responses were subject to a number of standard procedures (e.g., box plots, Mahalanobis distance) to check for outliers (Hair et al., 2010), resulting in the elimination of a small number of outlying observations. After eliminating outliers and surveys with excessive missing values (Olinsky et al., 2003), a healthy sample of 614 usable responses (response rate of 19.81%) remained for use in subsequent analysis. Table 1 presents the demographic characteristics of respondents.

*—Insert Table 1 here—
Respondent Firm Demographics*

To evaluate non-response bias as well as to rule out systematic differences between responses received at various stages of the data-collection process, analysis of variance was used to compare sets of responses, including early versus late responses (Armstrong and Overton, 1977; Hair et al., 2010). No significant differences are identified, suggesting that response bias does not unduly confound further analysis.

4.2 Analysis: Construct Evaluation and Model Fit

To test the hypothesised relationships, survey questions were developed following the scale-development procedures suggested by Churchill (1979). Items used in the constructs were derived from previous research, either from existing scales or documented empirical results. The previous discussion of the theoretical model and hypotheses highlights the prior studies from which the questions and items were drawn and developed. Table 2 contains the final items used in each of the four constructs.

*—Insert Table 2 here—
Descriptive Statistics for Manifest Indicators*

4.3 Construct Evaluation

Because structural equation modelling (SEM) is sensitive to non-normality, the constructs were tested for normality following the procedures outlined by Hair et al. (2010). None of the measures exceed the recommended thresholds for skewness or kurtosis, thus maximum likelihood estimation is appropriate (MacCallum et al., 1992). We further evaluated the construct acceptability in a multi-stage fashion beginning with an exploratory factor analysis (Principal Component Analysis; Varimax Rotation) on both the independent and dependent measures (Hulland, 1999; Gerbing and Anderson, 1988). The results, assessed with the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity (Hair et al., 2010), fully support the hypothesised factor structure. That is, items belonging to one construct load substantially (greater than 0.5) on a common factor and no larger than .30 on any other factors (Nunnally, 1978).

Next, we evaluated the adequacy of the measurement indicators by assessing the loadings of individual items on their constructs (Shook et al., 2004). All items load onto their predicted latent variables very strongly and significantly, and all manifest variables also have high R^2 values, suggesting acceptable reliability (see Table 3). Constructs were then assessed for reliability via Cronbach's alpha coefficients as well as composite reliability scores for each construct (see Table 4). The alpha coefficients range between .73 and .86 and the composite reliabilities range between .80 and .89, which indicate excellent reliability (Chin, 1998). Finally, the convergent and discriminant validity of the measures were assessed using the average variance extracted (AVE) for each construct as well as the correlations between the constructs. As Table 4 indicates, the AVE for all constructs is greater than .5 and therefore demonstrates satisfactory convergent validity (Chin, 1998). Since the square roots of the AVEs (i.e., the bold,

diagonal column) are greater than the correlations between the constructs, acceptable discriminant validity is demonstrated (Chin, 1998; Fornell and Larcker, 1981).

—Insert Table 3 here—
Manifest Variable Validity and Reliability

—Insert Table 4 here—
Construct Correlation Matrix and Latent Variable Reliability and Validity

To summarise, the constructs are adequately normal, theoretically unique, and possess good reliability as well as acceptable convergent and discriminant validity. We can be reasonably confident that the measured items reflect the theoretical constructs they are designed to measure. Further, since use of rigorous tests to establish convergent and discriminant validity have shown the factors to be distinct and unique, we conclude that common methods bias does not unduly affect the interpretability of the findings (Podsakoff et al., 2003).

4.4 Model Fit

To test the hypothesised relationships, we estimated a series of covariance-based structural models. Results of the analysis are shown graphically in Figure 2. Specifically, because the Chi-Square test is biased against large samples (Bollen and Long, 1993), a number of random sub-samples are developed of N=150, N=300 and N=400. The ratio of chi-square divided by the model's degrees of freedom (χ^2/df) is estimated, yielding a χ^2/df score of 3.6, which falls within suggested boundaries for acceptable model fit (see Medsker et al., 1994; Tanaka 1993; Bollen and Long, 1993). The summary fit indices also provide evidence that the proposed model fits the data well (CFI = .899, IFI = .900., GFI = .926, AGFI = .900, RMSEA = .062).

Further, to determine the significance of the paths and to ensure robust estimates, we applied bootstrapping re-sampling procedures with varying sample and case sizes (Chin, 1998),

yielding stable results. The results reported in Figure 2 are based on 200 samples of 500 cases (Hair et al., 2010). Importantly, the R^2 values also provide evidence of the explanatory power of the model. Following norms for interpretations of the effect size of R^2 values by Clark-Carter (1997), the reported effect sizes are classified as large.

—Insert Figure 2 here—

Estimated Model of Relational Architecture, Relational Capability, and Relationship Quality

5. Results And Discussion

5.1 Relational Capability

Gulati and Kletter (2005) describe relationship-centered organisations as firms with an increasing focus on fewer activities and sourcing the rest from strategic suppliers. They depend on a well-developed relational capability to access network resources through the creation of relational and social capital. As such, they seek trusting and committed partners (Morgan and Hunt, 1984; Palmatier et al., 2006). Maturity in relational capability portends enhanced relationships and performance improvement (Wu et al., 2006).

Hypothesis 1 assesses the influence of a firm's relational capability on relationship quality. The β -coefficient of .55 shows that Relational Capability is positively and strongly related to Relationship Quality ($t = 9.127$, $p < .01$). Firms that focus on strategic supplier management, establish executive sponsorship, define process ownership, and pursue continuous improvement in partnership with strategic suppliers achieve higher levels of relationship quality. The relationship quality construct contains items matching the foundational elements of relational capital, including trust, commitment, and relationship satisfaction. Two items indicate satisfaction—suppliers wanting to work with customers and seeing them as a preferred customer. Trust is captured through open and cooperative relationships (on both sides of the

exchange), clarity in roles and responsibilities, and transparency regarding contact points.

Interest in joint returns and value creation over simple price reductions indicates a commitment to a relationship.

The strong relationship between relational capability and relationship quality validates firms' efforts to invest in processes and develop close relationships with strategic suppliers. Such relationships capture resources and nurture capabilities deemed critical to the buying firm. Buying firms that cultivate strong relationships become strategic suppliers' preferred customers and engender supplier commitment to the relationship, enabling joint value-creation initiatives. Such high-quality relationships spur innovation and provide protection against supply disruptions in an uncertain and chaotic environment. These outcomes are critical to gaining access to resources and routines residing in the supply network.

This finding further supports previous empirical research in this area regarding the actions to improve relational capability (Bernardes, 2010; Lintukangas, 2011) and their affect of the drivers of relational quality (Skarmas, et al., 2008). We should, however, note that on a one-to-five scale, the overall mean for Relational Capability is 3.36. This relatively low score evinces a definite opportunity to strengthen firms' commitment to and investment in their relational capabilities.

5.2 Relational Architecture

The RBV has evolved to argue that *how* a firm organises and deploys resources is critical to organizational success (Fawcett et al., 2011). The *how* highlights the role of architecture in achieving a relational capability and characterises the organisational mechanisms necessary to access strategic network resources (Dyer and Singh, 1998). Hypotheses 2 and 3 therefore evaluate the influence of internal and external relational architectural routines in the relational

capability development process. Specifically, routine investments are best leveraged for advantage when they contribute to building exchange environments that enable enhanced collaboration among strategic trading partners. Sawhney and Zabin (2002) depict relationally-mature firms as having support from top leadership, high satisfaction levels across relationships, an optimised infrastructure for relationship management, integrated and coordinated processes, and strong performance measurement programs.

Hypothesis 2 examines the influence of a firm's investments in internal relational architecture; that is, the commitment of resources to supply initiatives and the development of effective supply frameworks. The β -coefficient of .53 denotes that Internal Relational Architecture is positively and strongly related to Relational Capability ($t = 8.10, p < .01$). A firm's emphasis on establishing the internal organisation, frameworks, and skills to work effectively and proactively with suppliers is critical to the development of a relational capability. Building joint improvement and new product teams that are supported by redefined metrics and incentives refocus the organisation on relational rather than focal-firm-only capabilities. Adapting internal governance levers—specifically through aligned contracts and metrics—supports relational exchange and contributes to building a collaborative relational space. These elements of internal relational architecture, when deployed properly, shape the inter-organisational space to meet the aspirations of buyers and their strategic suppliers (Nadler et al., 1992; Cousins et al., 2006).

The caveat in this analysis is that the construct for internal relational architecture obtained the lowest overall mean (2.68) of the four constructs evaluated, suggesting many firms persist in managing even their strategic supply relationships reactively, continuing to focus on minimising costs and transactional contracting.

Hypothesis 3 explores the effect of a firm's investments in external relational architecture; that is, initiatives designed to understand supplier abilities and strategies, increase the frequency and intensity of collaborative activities, and enhance governance through feedback and communication at high-levels in the hierarchies of each firm. The β -coefficient of .20 reveals that External Relational Architecture is positively and significantly related to Relational Capability ($t = 4.61, p < .01$). To build effective and appropriate relationships with suppliers, granular and timely information regarding supplier performance is necessary. Creating structure and processes to share this information—at the highest levels in the firms—supports open communication and trust building. Over time, moving from performance feedback to discussing strategic plans further cements cognition and understanding. This information must then be translated into specific collaboration programs. These activities, specifically directed at partners outside of a firm's boundary, demonstrate the commitment necessary to engender strong relations (Krause et al., 2007) and the benefits that are created through repeated exchange (Elfenbein and Zenger, 2014). The overall construct mean of 2.80 indicates that firms are not fully engaged in establishing a vibrant external architecture.

6. Conclusions

The resource-based and relational views of the firm suggest that by accessing and reconfiguring resources and routines that reside outside of their organisational boundaries, firms can capture superior rents. Efficient and effective governance, however, is critical to gaining this access. Unfortunately, although a growing body of research is emerging to evaluate inter-organizational relationships, relatively little empirical research has been conducted to specifically decompose the internal and external architecture necessary within and between buyers and suppliers. To redress this important gap in the literature, our study investigates the

governance linkages between structural and infra-structural decisions made in the firm and with partners (relational architecture), skill and maturity of managing relationships (relational capability) and the satisfaction and quality associated with those relationships (relational capital).

There are notable theoretical contributions of the study. First, our overall model supports Jacobides' (2006) research program addressing how architecture decisions, in response to the need created by firm boundary decisions, influence the development of capabilities. As trends such as the reliance on outsourcing, focusing on the core, and obtaining innovation from a firm's network persist and grow, developing a relational capability will distinguish the winners of tomorrow's global competition. Second, we demonstrate a significant relationship between elements of internal relational architecture and relational capability. Developing policies guiding effective metrics and contracts, creating a continuous improvement culture, and building effective cross-functional teams contribute to both preparing for inter-firm relationships as well as leveraging the resources they make available. Third, we also demonstrate a significant relationship between elements of external relational architecture and relational capability, including joint process management, governance through performance evaluation and feedback, and the shared cognition of understanding strategic plans (Benardes, 2010). Importantly, these contributions help not only define the role of relational architecture but also begin to establish more robust measures for internal and external relational architectural constructs. Given recent calls from Chatain (2010) and Sirmon et al. (2011) to assess *how* firms develop relational capital, this study contributes the literature by decomposing the relational capability into its internal and external elements.

Fourth, this project adds to the growing evidence confirming the positive relationship between a competence in building relationships and the realisation of social and relational

capital, critical to developing the trust and commitment necessary to access network resources.

Fifth, we contribute to the literature on relational capital by using a robust measure of relationship quality in its stead. The core elements of each construct—trust, commitment, and satisfaction—are very similar and allow researchers another conceptualisation of capital.

Relational capability's positive and significant influence on relationship quality importantly supports the need for proactive investments in 'soft' governance mechanisms in order to leverage relationship management as a dynamic capability. While Dyer and Singh (1998) suggest the possibilities of relational rents, they importantly note that developing appropriate 'organisational mechanisms' is critical to gaining access to critical network resources. This research begins to shed light on how firms develop the mechanisms and governance routines that create a relational capability.

By empirically validating the linkage between architecture, capability, and relationship quality, we help justify the need to reconsider investing in a stronger, more mature relational governance mechanisms as manifest by relational capability. By defining and measuring the nature of relational architecture, we help to provide guidance related to the type of investments needed to tap into the resources that reside up and down the supply chain. This insight makes it easier—and less risky—to cultivate relational quality for competitive advantage.

6.1 Managerial Implications

Given the inexorable shift to increased outsourcing, the mandate for buying firms is to ensure that critical and scarce resources are still available to other users and processes in the company. In exchanges with strategic suppliers, these results indicate that 'architecting' collaborative space through policies and behaviours improves—and learning how to improve policies and behaviours over time—results in higher relationship quality. Building relational

capital with strategic suppliers enables access to technology and other critical resources. Crafting thoughtful policies regarding incentives and metrics, working jointly on improvements and corrections, and integrating with suppliers at early development stages enhance a firm's relational capability. Maturing organisational procedures and structures to manage strategic relationships with executive-level oversight exemplifies strategic supplier management. Clarity of responsibility for strategic relationships accelerates the learning process and increases access to strategic resources embedded in trading networks. Unfortunately, the data—in particular, the low means for critical internal and external architecture constructs—reveal that most firms persist in in rudimentary governance, making it more difficult to leverage network resources for competitive advantage. Relational governance remains an underexplored and underutilized source of competitive advantage.

REFERENCES

- Adler, P.S. and Kwon, S.W. (2002) 'Social capital: Prospects for a new concept', *Academy of Management Review*, Vol. 27, No. 1, pp.17-40.
- Allred, C.R., Fawcett, S.E., Wallin, C. and Magnan, G.M. (2011) 'A dynamic collaboration capability as a source of competitive advantage', *Decision Sciences*, Vol. 42, No. 1, pp.129-161.
- Amit, R. and Schoemaker, P.J.H. (1993) 'Strategic assets and organizational rent', *Strategic Management Journal*, Vol. 14, No. 1, pp.33-46.
- Amaral, J., Anderson, E.G. and Parker, G.G. (2011) 'Putting it together: How to succeed in distributed product development', *MIT Sloan Management Review*, Vol. 52, No. 2, pp.51-58.
- Armstrong, J.S. and Overton, T.S. (1977) 'Estimating nonresponse bias in mail surveys', *Journal of Marketing Research*, Vol. 14, No. 3, pp.396-405.
- Barney, J. (1991) 'Firm resources and sustained competitive advantage', *Journal of Management*, Vol. 17, No. 1, pp.99-120.
- Barringer, B.R. and Harrison, J.S. (2000) 'Walking a tightrope: Creating value through interorganizational relationships', *Journal of Management*, Vol. 26, No. 3, pp.367-403.
- Bensaou, M. (1999) 'Portfolios of buyer-supplier relationships', *Sloan Management Review*, Vol. 40, No. 4, pp.35-44.
- Bernardes, E. (2010) 'The effect of supply management on aspects of social capital and the impact on performance: a social network perspective', *Journal of Supply Chain Management*, Vol. 46, No. 1, pp.45-56.
- Bollen, K.A. and Long, J.S. (1993) *Testing structural equation models*, Sage, Newbury Park, California.
- Cao, M. and Zhang, Z. (2011) 'Supply chain collaboration: Impact on collaborative advantage and firm performance', *Journal of Operations Management*, Vol. 29, No. 3, pp.163-180.
- Carr, A.S. and Kaynak, H. (2007) 'Communication methods, information sharing, supplier development and performance: An empirical study of their relationships', *International Journal of Operations and Production Management*, Vol. 27, No. 4, pp.346-370.
- Carr, A.S. and Pearson, J.N. (2002) 'The impact of purchasing and supplier involvement on strategic purchasing and its impact on firm's performance', *International Journal of Operations & Production Management*, Vol. 22, No. 9/10, pp.1032-1053.
- Chatain, O. (2010) 'Value creation, competition, and performance in buyer-supplier relationships', *Strategic Management Journal*, Vol. 32, No. 1, pp.76-102.

- Chen, I.J., Paulraj, A. and Lado, A.A. (2004) 'Strategic purchasing, supply management, and firm performance', *Journal of Operations Management*, Vol. 22, No. 5, pp.505-523.
- Chin, W.W. (1998) *The partial least squares approach to structural equation modeling*, Lawrence Erlbaum, Mahwah, NJ.
- Churchill, G.A.J. (1979) 'A paradigm for developing better measures of marketing constructs', *Journal of Marketing Research*, Vol. 16, No. 1, pp.64-73.
- Clark-Carter, D. (1997) *Doing quantitative psychological research: From design to report*, Psychology Press, Hove, UK.
- Collins, J.D. and Hitt, M.A. (2006) 'Leveraging tacit knowledge in alliances: The importance of using relational capabilities to build and leverage relational capital', *Journal of Engineering & Technology Management*, Vol. 23, No. 3, pp.147-167.
- Cousins, P.D., Handfield, R.B., Lawson, B. and Petersen, K. J. (2006) 'Creating supply chain relational capital: The impact of formal and informal socialization processes', *Journal of Operations Management*, Vol. 24, No. 6, pp.851-863.
- Cousins, P.D. and Spekman, R. (2003) 'Strategic supply and the management of inter- and intra-organizational relationships', *Journal of Purchasing and Supply Management*, Vol. 9, No. 1, pp.19-29.
- Day, M., Fawcett, S.E., Fawcett, A.M., and Magnan, G.M. (2013) 'Trust and relational embeddedness: Exploring a paradox of trust pattern development in key supplier relationships', *Industrial Marketing Management*, Vol. 42, No. 2, pp.152-165.
- Dierickx, I. and Cool, K. (1989) 'Asset stock accumulation and sustainability of competitive advantage', *Management Science*, Vol. 35, No. 12, pp.1504-1511.
- Dillman, D.A. (2000) *Internet and mail surveys: The tailored design method*, John Wiley & Sons, New York.
- Dorsch, M.J., Swanson, S.R. and Kelley, S.W. (1998) 'The role of relationship quality in the stratification of vendors as perceived by customers', *Journal of the Academy of Marketing Science*, Vol. 26, No. 2, pp.128-142.
- Dwyer, F.R., Schurr, P.H. and Oh, S. (1987) 'Developing buyer-seller relationships', *Journal of Marketing*, Vol. 51, No. 2, pp.11-27.
- Dyer, J.H. (1997) 'Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value', *Strategic Management Journal*, Vol. 18, No. 7, pp.535-556.
- Dyer, J.H. and Singh, H. (1998) 'The relational view: Cooperative strategy and sources of interorganizational competitive advantage', *Academy of Management Review*, Vol. 23, No. 4, pp.660-679.

- Eisenhardt, K.M. and Martin, J.A. (2000) 'Dynamic capabilities: What are they?', *Strategic Management Journal*, Vol. 21, No. 10-11, pp.1105-1121.
- Elfenbein, D.W. and Zenger, T.R. (2014) 'What is a relationship worth? Repeated exchange and the development and deployment of relational capital', *Organization Science*, Vol. 25, No. 1, pp. 222-244.
- Ettlie, J.E. and Pavlou, P.A. (2006) 'Technology-based new product development partnerships', *Decision Sciences*, Vol. 37, No. 2, pp.117-147.
- Fawcett, S.E. and Magnan, G.M. (2002) 'The rhetoric and reality of supply chain integration', *International Journal of Physical Distribution and Logistics Management*, Vol. 32, No. 5, pp.339-361.
- Fawcett, S.E., Wallin, C., Allred, C.R., Fawcett, A.M. and Magnan, G.M. (2011) 'Information technology as an enabler of supply chain collaboration: a dynamic-capabilities perspective,' *Journal of Supply Chain Management*, Vol. 47, No. 1, pp.38-59.
- Fawcett, S.E., Fawcett, A.M., Watson, B.J. and Magnan, G.M. (2012) 'Peeking inside the black box: Toward an understanding of supply chain collaboration dynamics,' *Journal of Supply Chain Management*, Vol. 48, No. 1, pp.44-72.
- Feldman, M.S. and Pentland, B.T. (2003) 'Reconceptualizing organizational routines as a source of flexibility and change', *Administrative Science Quarterly*, Vol. 48, No. 1, pp.94-118.
- Fjeldstad, Ø.D., Snow, C.C., Miles, R.E. and Lettl, C. (2012) 'The architecture of collaboration: Organizing resources among large sets of actors', *Strategic Management Journal*, Vol. 33, No. 6, pp.734-750.
- Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, Vol. 18, No. 1, pp.39-50.
- Gavetti, G. and Levinthal, D. (2000) 'Looking forward and looking backward: Cognitive and experiential search', *Administrative Science Quarterly*, Vol. 45, No. 1, pp.113-137.
- Gerbing, D.W. and Anderson, J.C. (1988) 'An updated paradigm for scale development incorporating unidimensionality and its assessment', *Journal of Marketing Research*, Vol. 25, No. 5, pp.186-192.
- Grant, R.M. (1996) 'Prospering in dynamically-competitive environments: Organizational capability as knowledge integration', *Organization Science*, Vol. 7, No. 4, pp.375-387.
- Gulati, R. (1998) 'Alliances and networks', *Strategic Management Journal*, Vol. 19, No. 4, pp.293-318.
- Gulati, R. and Singh, H. (1998) 'The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances', *Administrative Science Quarterly*, Vol. 43, No. 4,

pp.781-814.

- Gulati, R. and Kletter, D. (2005) 'Shrinking core, expanding periphery: The relational architecture of high-performing organizations', *California Management Review*, Vol. 47, No. 3, pp.77-104.
- Hair, J., Black, W., Babin, B. and Anderson, R. (2010) *Multivariate data analysis*, Pearson Prentice Hall, Upper Saddle River, New Jersey.
- Handley, S.M. (2012) 'The perilous effects of capability loss on outsourcing management and performance', *Journal of Operations Management*, Vol. 30, No. 1/2, pp.152-165.
- Hanghøj, A. and Mols, N.P. (2015) 'Purchasing and innovation: a capability-based analysis', *International Journal of Procurement Management*, Vol. 8, No. 4, pp.494-515.
- Holcomb, T.R. and Hitt, M.A. (2007) 'Toward a model of strategic outsourcing', *Journal of Operations Management*, Vol. 25, No. 2, pp.464-481.
- Hulland, J. (1999) 'Use of partial least squares (pls) in strategic management research: a review of four recent studies', *Strategic Management Journal*, Vol. 20, No. 2, pp.195-204.
- Hutchinson, D., Singh, J., Svensson, G. and Mysen, T. (2012) 'Inter-relationships among focal dimensions in relationship quality: a quantitative and exploratory approach'. *International Journal of Procurement Management*, Vol. 5, No. 2, pp.229-252.
- Jacobides, M.G. (2006) 'The architecture and design of organizational capabilities', *Industrial & Corporate Change*, Vol. 15, No. 1, pp.151-171.
- Jap, S.D., Manolis, C. and Weitz, B.A. (1999) 'Relationship quality and buyer-seller interactions in channels of distribution', *Journal of Business Research*, Vol. 46, No. 3, pp.303-313.
- Kähkönen, A-K. (2011) 'Power relations in supply strategies—a network approach', *International Journal of Procurement Management*, Vol. 4, No. 4, pp.386-401.
- Kale, P., Singh, H. and Perlmutter, H. (2000) 'Learning and protection of proprietary assets in strategic alliances: Building relational capital', *Strategic Management Journal*, Vol. 21, No. 3, pp.217-237.
- Kar, A.K. and Pani, A.K. (2014) 'Non-contractible value creation in buyer-supplier networks – a case study', *International Journal of Procurement Management*, Vol. 7, No. 5, pp.493-507.
- Kraaijenbrink, J., Spender, J. C. and Groen, A.J. (2010) 'The resource-based view: A review and assessment of its critiques', *Journal of Management*, Vol. 36, No. 2, pp.349-372.
- Krause, D.R., Handfield, R.B. and Tyler, B.B. (2007) 'The relationships between supplier development, commitment, social capital accumulation and performance improvement', *Journal of Operations Management*, Vol. 25, No. 2, pp.528-545.

- Lavie, D. (2006) 'The competitive advantage of interconnected firms: An extension of the resource-based view', *Academy of Management Review*, Vol. 31, No. 3, pp.638-658.
- Lawson, B., Tyler, B.B. and Cousins, P.D. (2008) 'Antecedents and consequences of social capital on buyer performance improvement', *Journal of Operations Management*, Vol. 26, No. 3, pp.446-460.
- Leiblein, M.J. and Miller, D.J. (2003) 'An empirical examination of transaction- and firm-level influences on the vertical boundaries of the firm', *Strategic Management Journal*, Vol. 24, No., pp.839-859.
- Leonidou, L.C., Barnes, B.R. and Talias, M.A. (2006) 'Exporter-importer relationship quality: The inhibiting role of uncertainty, distance, and conflict', *Industrial Marketing Management*, Vol. 35, No. 5, pp.576-588.
- Li, J., Poppo, L. and Zheng, K. (2010) 'Relational mechanisms, formal contracts, and local knowledge acquisition by international subsidiaries', *Strategic Management Journal*, Vol. 31, No. 4, pp.349-370.
- Li, X., Olorunniwo, F., Jolayemi, J. and Fan, C. (2014) 'Re-examining the structure of supplier stratification matrix: a focus on differential value and relationship', *International Journal of Procurement Management*, Vol. 7, No. 2, pp.219-237.
- Linder, J., Jarvenpaa, S. and Davenport, T. (2003) 'Innovation sourcing strategy matters', *MIT Sloan Management Review*, Vol. 44, No. 4, pp.43-49.
- Lintukangas, K. (2011) 'Supplier relationship management capability in global supply management', *International Journal of Procurement Management*, Vol. 4, No. 1, pp.1-19.
- Litwak, E. and Hylton, L.F. (1962) 'Interorganizational analysis: A hypothesis on coordinating agencies', *Administrative Science Quarterly*, Vol. 6, No. 4, pp.395-420.
- Lorenzoni, G. and Lipparini, A. (1999) 'The leveraging of interfirm relationships as a distinctive organizational capability: A longitudinal study', *Strategic Management Journal*, Vol. 20, No. 4, pp.317-339.
- Lusch, R.F. and Brown, J.R. (1996) 'Interdependency, contracting, and relational behavior in marketing channels', *Journal of Marketing*, Vol. 60, No. 4, pp.19-38.
- MacCallum, R., Roznowski, M. and Necowitz, L. (1992) 'Model modification in covariance structure analysis: The problem of capitalization on chance', *Psychological Bulletin*, Vol. 111, No. 3, pp.490-504.
- Madhok, A. (2002) 'Reassessing the fundamentals and beyond: Ronald coase, the transaction cost and resource-based theories of the firm and the institutional structure of production', *Strategic Management Journal*, Vol. 23, No. 6, pp.535-551.

- Madhok, A. and Tallman, S.B. (1998) 'Resources, transactions and rents: Managing value through interfirm collaborative relationships', *Organization Science*, Vol. 9, No. 3, pp.326-339.
- Medsker, G.J., Williams, L.J. and Holohan, P.J. (1994) 'A review of current practice for evaluating causal models in organizational behavior and human resources management research', *Journal of Management*, Vol. 20, No. 2, pp.439-464.
- Morgan, R.M. and Hunt, S.D. (1994) 'The commitment-trust theory of relationship marketing', *Journal of Marketing*, Vol. 58, No. 3, pp.20-39.
- Nadler, D.A., Gerstein, M.S. and Shaw, R.B. (1992) *Organizational architecture: Designs for changing organizations*, Jossey Bass, San Francisco, CA.
- Nunnally, J.C. (1978) *Psychometric theory*, McGraw-Hill Book Company, New York.
- Olsen, R.F. and Ellram, L.M. (1997) 'A portfolio approach to supplier relationships', *Industrial Marketing Management*, Vol. 26, No. 2, pp.101-114.
- Olinsky, A., Chen, S. and Harlow, L. (2003) 'The comparative efficacy of imputations methods for missing data in structural equation modelling', *European Journal of Operational Research*, Vol. 151, No., pp.53-79.
- Palmatier, R.W., Dant, R.P., Grewal, D. and Evans, K.R. (2006) 'Factors influencing the effectiveness of relationship marketing: A meta-analysis', *Journal of Marketing*, Vol. 70, No. 4, pp.136-153.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003) 'Common method biases in behavioral research: A critical review of the literature and recommended remedies', *Journal of Applied Psychology*, Vol. 88, No. 5, pp.879-903.
- Ring, P.S. and Van de Ven, A.H. (1994) 'Developmental processes of interorganizational cooperative relationships', *Academy of Management Review*, Vol. 19, No. 1, pp.90-118.
- Saccani, N. and Perona, M. (2007) 'Shaping buyer-supplier relationships in manufacturing contexts: Design and test of a contingency model', *Journal of Purchasing & Supply Management*, Vol. 13, No. 1, pp.26-41.
- Sawhney, M. and Zabin, J. (2002) 'Managing and measuring relational equity in the network economy', *Journal of the Academy of Marketing Science*, Vol. 30, No. 4, pp.313-332.
- Shin, H., Collier, D.A. and Wilson, D.D. (2000) 'Supply management orientation and supplier/buyer performance', *Journal of Operations Management*, Vol. 18, No. 3, pp.317-333.
- Shook, C., Ketchen, D., Hult, G. and Kacmar, K. (2004) 'An assessment of the use of structural equation modeling in strategic management research', *Strategic Management Journal*, Vol. 24, No. 12, pp.397-404.

- Simon, H.A. (1962) 'The architecture of complexity', *Proceedings of the American Philosophical Society*, Vol. 106, No. 6, pp.467-482.
- Sirmon, D.G., Hitt, M.A., Ireland, R.D. and Gilbert, B.A. (2011) 'Resource orchestration to create competitive advantage breadth, depth, and life cycle effects', *Journal of Management*, Vol. 37, No. 5, pp.1390-1412.
- Skarmeas, D., Katsikeas, C. S., Spyropoulou, S. and Salehi-Sangari, E. (2008) 'Market and supplier characteristics driving distributor relationship quality in international marketing channels of industrial products', *Industrial Marketing Management*, Vol. 37, No. 1, pp.23-36.
- Slowinski, G., Hummel, E., Gupta, A. and Gilmont, E.R. (2009) 'Effective practices for sourcing innovation', *Research Technology Management*, Vol. 52, No. 1, pp.27-34.
- Spekman, R.E. and Carraway, R. (2006) 'Making the transition to collaborative buyer–seller relationships: An emerging framework', *Industrial Marketing Management*, Vol. 35, No. 1, pp.10-19.
- Tan, K.C., Lyman, S.B. and Wisner, J.D. (2002) 'Supply chain management: A strategic perspective', *International Journal of Operations & Production Management*, Vol. 22, No. 6, pp.614-631.
- Tanaka, J.S. (1993) *Multifaceted conceptions of fit in structural equation models. In testing structural equation models*, Sage, Newbury Park, CA.
- Wagner, S.M. (2012) 'Tapping supplier innovation', *Journal of Supply Chain Management*, Vol. 48, No. 2, pp.37–52.
- Weigelt, C. (2009) 'The impact of outsourcing on new technologies on integrative capabilities and performance', *Strategic Management Journal*, Vol. 30, No. 6, pp.595-616.
- Wu, F., Yeniyurt, S., Kim, D. and Cavusgil, S.T. (2006) 'The impact of information technology on supply chain capabilities and firm performance: A resource-based view', *Industrial Marketing Management*, Vol. 35, No. 4, pp.493-504.
- Zacharia, Z.G., Nix, N.W. and Lusch, R.F. (2009) 'An analysis of supply chain collaborations and their effect on performance outcomes', *Journal of Business Logistics*, Vol. 30, No. 2, pp.101-123.
- Zollo, M. and Winter, S. G. (2002) 'Deliberate learning and the evolution of dynamic capabilities', *Organization Science*, Vol. 13, No. 3, pp.339-351.

Table 1: Respondent Firm Demographics

Sector/Industry	Total annual sales revenue	Total number of suppliers of the organisation	Total annual supplier expenditure as percentage of sales revenue
16% Telecommunication	24% less than \$200m	25% 1 to 100	8% 0 - 10%
13% Consumer Products	16% \$201m - \$1bn	16% 101 to 500	13% 11 - 20%
8% Financial Services	9% \$1bn - \$2bn	10% 501 to 1,000	14% 21 - 30%
7% Chemical/Oil/Gas	19% \$2bn - \$10bn	20% 1,001 to 5,000	12% 31 - 40%
6% Pharmaceutical	12% \$10bn - \$20bn	15% 5,001 to 25,000	10% 41 - 50%
5% Retail	20% greater than \$20bn	5% 25,001 to 50,000	13% 51 - 60%
4% Construction		2% 50,001 to 100,000	10% 61 - 70%
4% Energy/Utility		2% more than 100,000	4% 71 - 80%
4% Healthcare		5% Don't know	3% 81 - 90%
4% Professional Services			1% 91 - 100%
Between 1% - 3% each: agriculture/forestry, aerospace/airline; engineering; pulp/paper; entertainment; metals/minerals/mining; transportation (11% Other)			1% Don't know

Table 2: Descriptive Statistics for Manifest Indicators

External Relational Architecture		
<i>Mean = 2.80; Composite reliability =.89; AVE=.59</i>		
<i>6 pairs of statements relating to current practices with strategic suppliers. Respondents select a rating for their current level on each practice from a five-point scale with the following anchor points.</i>		
	Mean	Std. Dev.
We do not have jointly planned, detailed work streams with strategic suppliers (1) <i>VERSUS</i> We have jointly planned and detailed work streams with strategic suppliers (5).	2.70	1.17
We do not work regularly with strategic suppliers on new ways of reducing costs (1) <i>VERSUS</i> We regularly work with strategic suppliers to find new ways of reducing costs (5).	3.00	1.13
There are gaps in our understanding of strategic suppliers' strategies and plans (1) <i>VERSUS</i> There is real understanding of strategic suppliers' business strategies (5).	2.72	1.07
There is no regular, board to board review process between us and strategic suppliers (1) <i>VERSUS</i> There is regular, board to board review and agreement with our strategic suppliers (5)	2.47	1.25
We do not formally review key data and information about strategic suppliers (1) <i>VERSUS</i> We have forums and reviews to examine internal data about strategic suppliers (5).	2.98	1.23
We do not understand the future impact of strategic suppliers' plans on our business (1) <i>VERSUS</i> We fully understand the future impact of strategic suppliers' plans on our business (5). ¹	2.85	1.09
Internal Relational Architecture		
<i>Mean = 2.68; Composite reliability =.84; AVE=.56</i>		
<i>4 pairs of statements relating to current practices with strategic suppliers. Respondents select a rating for their current level on each practice from a five-point scale with the following anchor points.</i>		
	Mean	Std. Dev.
We use conventional contracts and concentrate on performance to contract (1). <i>VERSUS</i> Contracting has been restructured with new metrics, incentives and frameworks (5).	2.63	1.17
Performance improvement is driven by problems. We have few plans and tools (1). <i>VERSUS</i> We are using corrective action teams, lean, six sigma and Kaizen type tools (5).	2.67	1.16
Our focus tends to be on purchase price and reducing costs through negotiation (1). <i>VERSUS</i> We have joint cost down projects focused on cost drivers across the supply chain (5).	2.67	1.18
Innovation to products, services and processes is primarily an in-house activity (1). <i>VERSUS</i> We have integrated external supplier innovation into design and development (5).	2.74	1.20
Relational Capability		
<i>Mean = 3.36; Composite reliability =.80; AVE=.50</i>		
<i>Respondents consider each statement and provide an assessment of their organisation's current approach to strategic supplier management.</i>		
	Mean	Std. Dev.
We have little or no focus on strategic supplier management. ¹	3.51	1.23
Neither side has an effective process to agree and drive major improvements. ¹	3.21	1.07

It is unclear who 'owns' and controls strategic supplier relationships. ¹	3.29	1.29
We have a senior executive in our organisation who 'owns' and leads this area.	3.29	1.41
Procurement's involvement in strategic supplier management is low.	3.51	1.26
Relationship Quality <i>Mean = 3.38; Composite reliability =.89; AVE=.56</i>		
<i>Respondents consider each statement and provide an assessment how strategic suppliers currently view their organisation.</i>	Mean	Std. Dev.
An improving organisation. Strategic suppliers want to work with us.	3.81	0.80
A great organisation to do business with. A preferred customer.	3.44	0.93
Relationships are excellent, open and co-operative on both sides.	3.28	0.90
Not easy to work with. Unclear roles, responsibilities and contact points ¹ .	3.40	1.12
Committed to maximising value jointly and sharing the benefits with them.	3.19	0.98
Only interested in price reductions and cost down initiatives ¹ .	3.15	1.11

¹ reverse coded

Table 3: Manifest Variable Validity and Reliability

	Unstand- ardised coefficient	Std. Error	Critical Ratio	Standardised weight	R ²
External Relational Architecture					
(1) Jointly planned, detailed work streams	1.379	.100	13.860	.731*	.534
(2) Working with suppliers on reducing cost	1.327	.097	13.723	.729*	.531
(3) Understanding suppliers' strategies and plans	1.269	.081	15.731	.731*	.534
(4) Regular board to board reviews	1.356	.101	13.450	.679*	.461
(5) Formal reviews of suppliers' internal data	1.456	.104	13.979	.723*	.523
(6) Understanding the future impact of suppliers' plans on our business	1.039	.080	13.014	.584*	.341
Internal Relational Architecture					
(7) New internal metrics, incentives and frameworks	.9321	.072	12.919	.680*	.462
(8) Use of corrective action teams, six sigma etc.	.070	.082	12.976	.734*	.539
(9) Focus on cost driver projects	1.039	.084	12.416	.696*	.484
(10) Integrated innovation into design and development	.826	.081	10.211	.546*	.298
Relational Capability					
(11) Little or no focus on strategic supplier management ¹	1.017	.073	14.004	.655*	.429
(12) No process to agree and drive improvement ¹	.669	.058	11.460	.498*	.248
(13) Unclear who owns and controls relationships ¹	.857	.071	12.067	.595*	.354
(14) Senior executive who owns and leads this area	.770	.078	9.861	.433*	.187
(15) Procurement involvement in strategic supplier management low ¹	.841	.069	12.129	.532*	.283
Relationship Quality					
(16) Improving organisation. Suppliers want to work with us	.577	.054	10.642	.516*	.266
(17) A preferred customer to do business with	.746	.061	12.163	.576*	.332
(18) Relationships are open & cooperative on both sides	.849	.061	13.806	.677*	.458
(19) Unclear roles, responsibilities and contact points ¹	.898	.081	11.093	.573*	.328
(20) Committed to maximising value jointly and sharing	1.121	.101	11.098	.734*	.539
(21) Only interested in price reductions ¹	.789	.073	10.871	.507*	.257
¹ reverse coded items * p<0.01					

Table 4: Construct Correlation Matrix and Latent Variable Reliability and Validity

	Cronbach alpha	Composite reliability	Average variance extracted	Construct correlation matrix			
				External Relational Architecture	Internal Relational Architecture	Relational Capability	Relation- ship Quality
External Relational Architecture	.864	.895	.586	.765¹			
Internal Relational Architecture	.776	.837	.564	.643	.751¹		
Relational Capability	.731	.800	.501	.589	.478	.708¹	
Relationship Quality	.788	.886	.564	.373	.347	.361	.751¹
¹ Square root of AVE is on the diagonal of the construct correlation matrix.							

Figure 1: Theoretical Model: The Connection Among Architecture, Capability, and Relationship

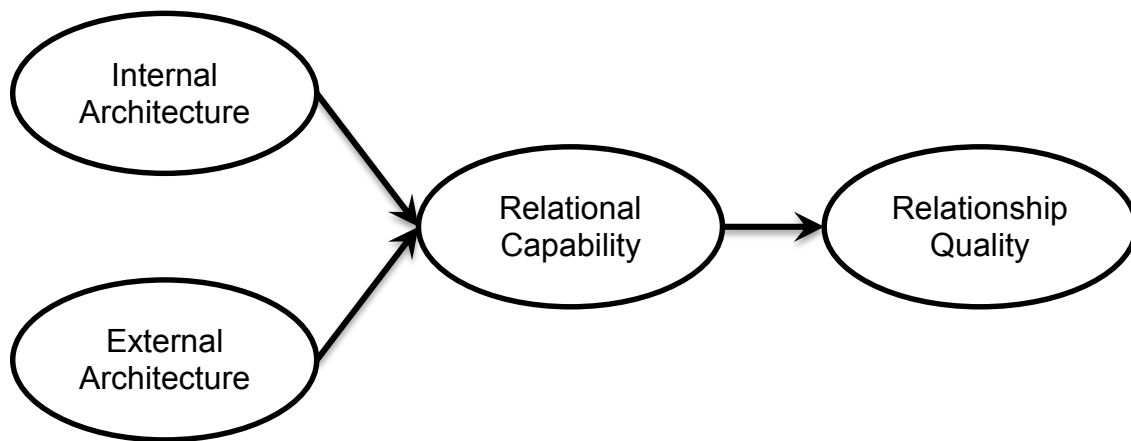


Figure 2: Estimated Model of Relational Architecture, Relational Capability, and Relationship Quality

