

# **HETEROGENEITY IN THE QUALITY-SATISFACTION-LOYALTY FRAMEWORK: A MULTI-GROUP ANALYSIS IN A BUSINESS-TO- BUSINESS BUYER NETWORK**

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## **ABSTRACT**

Loyalty and satisfaction in business-to-business relationships benefits from a myriad of conceptualisations feeding the notion that securing buyer loyalty via customer satisfaction is critical for success. Equally as many studies have shown that the relationship between customer satisfaction and attitudinal loyalty is mediated by trust, commitment and the sharing of timeous and accurate information in the dyad. Far fewer studies have attempted to compare the results of these quality-satisfaction-loyalty models across different groups to account for heterogeneity across dyads. In this study we build on earlier work to empirically confirm the notion that relationship satisfaction leads to attitudinal loyalty and demonstrate that trust, commitment and information sharing mediates this relationship. We then compare the confirmed model across selected sources of heterogeneity originating from the variance in actors' demographics and market characteristics. Our study employed a focal firm approach to consider a network of buyers in the South African Computer Aided Design (CAD) industry. Data was collected from 497 respondents and the empirical model was tested using variance based Structural Equation Modelling and Finite Mixture modelling. Our results show that the link between relationship satisfaction and attitudinal loyalty is fully mediated by trust and commitment. Our results also identify sources of heterogeneity based on gender, age, sector, managerial level and education. Beyond offering further support for the quality-satisfaction-loyalty causal chain, the study provides evidence of heterogeneity often characteristic of high context emerging markets. The findings provide researchers and practitioners with insights as to how dyadic relationship management practices may need to be altered for different groups and contexts.

**Keywords:** Business-to-Business Relationships, Satisfaction, Trust, Commitment, Information Sharing, Loyalty, Multi-group analysis.

1) Competitive paper

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## **INTRODUCTION**

Spurred by growing empirical evidence, numerous studies consider the interdependence of social capital constructs and their role in business-to-business relationships (Håkanson, Harrison & Waluszewski, 2004; Sirdeshmukh, Singh & Sabol, 2002). Especially, our understanding of the social drivers of business-to-business relationships have benefitted from various conceptual, meta-analytical and empirical contributions to explain their direct and indirect effects in business relationships (Rajamma, Zolfagharian & Pelton, 2011; Geyskens, Steenkamp & Kumar, 1999; Palmatier, Dant, Grewal & Evans, 2006 and Pels, Möller & Saren, 2009). By the same measure, some authors (Rampersad, Quester & Troshani, 2010) caution that despite increases in the complexity and prominence of studies in business-to-business dyads, empirical work that investigates their performance is still rather sparse. Nevertheless, in considering the extant literature on business-to-business relationships (Garbarino & Johnson, 1999; Eggert & Ulaga 2002; Hald, Cordón & Vollmann, 2009; Halinen, 1997; Harris, O'Malley & Patterson, 2003; Boonlertvanich 2009; Young, 2006 and Schiele, Veldman & Hüttinger, 2010) the notion of a causal chain where product and service quality drives customer satisfaction, which in turn promotes customer loyalty, is well supported.

This Quality-Satisfaction-Loyalty (Q-S-L) paradigm provides a platform and motivation for considering social capital in business-to-business relationships. For example, Anderson, Fornell & Lehmann (1994) and Jones & Sasser (1995) has demonstrated that (a) customer satisfaction is the key to securing customer loyalty and generating superior long-term financial performance, (b) that quality has a positive effect on satisfaction, and (c) that in turn has a positive effect on performance. Anderson & Sullivan (1993) and Hennig-Thurau & Klee (1997) also showed that satisfaction leads to repeat purchases. Within this Q-S-L paradigm, as suggested by Morgan & Hunt (1994), commitment and trust are key mediating variables in business-to-business relationships. Moreover, it is alleged that failing to include commitment and trust as key mediating variables would result in flawed conclusions regarding not only the direct impact of commitment and trust on important outcomes, but also the impact of other antecedents (Cannon & Perreault, 1999). In addition, Olsen (2002) demonstrated that satisfaction as a mediator between quality and repurchase loyalty was found to be an acceptable representation of the data across four different types of products. In short: The idea that product and service quality are primary drivers of relationship satisfaction which in turn drives customer loyalty is central to the notion of relationship marketing. In addition, the ability of the firm to convert satisfied customers into loyal customers is dependent on its ability to gain the trust of the customer in order to effect the customer's commitment to staying in the relationship. For this to happen, information needs to be shared among the buyers and sellers.

Notably absent from the studies mentioned above is the absence of considering heterogeneity. Business relationships and buyer and seller interaction takes place in varying circumstances,

contexts and environments. Aptly, environmental heterogeneity, market heterogeneity (Castro, Armario & Ruiz, 2007) and actor heterogeneity (Hadjikhani & Thilenius, 2009) have been shown to explain differences between groups in business-to-business relationships, and these researchers have pointed out that it should be accounted for when we generalise about the social drivers of business-to-business relationships.

The primary objective of our study is to confirm the Quality-Satisfaction-Loyalty (Q-S-L) (Olsen, 2002) paradigm in an emerging market context and then identify sources of heterogeneity. More specifically, we consider the mediation effects of satisfaction, trust, commitment, and information sharing in a structural model to predict intention to stay in a buyer-supplier relationship. Secondly, we expand the Q-S-L notion to include a consideration of context relevant source of mediation effects between predictor and outcome variables.

We employ a focal firm approach in a large buyer network in the South African Computer Aided Design (CAD) industry. The reference here to a buyer network means clients who purchase CAD software from the focal firm. These firms are all connected to the focal firm as clients of varying sizes and the research focused on the dyadic relationship between the focal firm (seller) and its clients (buyers). Therefore, the paper does not adopt a network perspective per se, but the dyads under consideration (arguably) all stem from a particular network of buyers.

Following this introductory section we offer a review of the literature and construct hypotheses to achieve the objectives of the study. Through this operationalization of the constructs, we hypothesize a possible structural model to predict attitudinal loyalty whilst allowing for interaction effects. We then describe the methodology based on a survey design which leads to a discussion of the results based on the data collected from 497 clients of the focal firm. We conclude with a discussion and some implications for further research.

## **LITERATURE REVIEW**

The social structure of a business relationship is about social ties between people across different organisations and how these ties spread out into a network of personal contacts, some deep, some indirect (Fill & Fill, 2005). This notion led Morgan & Hunt (1994) to conclude that the essence of relationships in business is the supplier's creation of commitment and trust between itself and a customer, with the intent of establishing, developing, and maintaining successful relational exchanges. Palmatier (2008) integrates the constructs of social exchange and refers to social ties as the drivers of customer value. Hence, a growing branch of research on business relationships in general, and satisfaction and loyalty in relationships in particular, focuses on the idea of relationship value. Relationship value as a construct for considering the performance of relationships is not without complexity and problems. For example, there is variance to be found in value delivery (Flint, Woodruff & Gardial, 2002 and Adjei, Griffith & Noble, 2009) and the presence of a time perspective (Medlin, 2004; Halinen & Tähtinen, 2002) limits the usefulness of a snapshot analysis of relational value (Eggert, Ulaga & Schultz, 2006). Hence for the purposes of this study relationship value was not specifically considered although its relevance to the Q-S-L chain is prominent in the literature.

Despite the limitations of a snapshot analysis of business-to-business relationships, Dong, Dresner & Shankar (2007) and Johnson, Sohi & Grewal (2004) showed that through the development of stable, trusting and committed supplier relationships, firms can effectively coordinate their supply chain to offer products and services that meet customers' needs and preferences. Moreover, Celuch, Bantham, & Kasouf (2006) showed that research in business relationships has demonstrated the importance of mutuality, trust, information sharing, and commitment. Through cooperative relationships, uncertainty can be reduced, resources pooled, costs shared, and problem solving can be more efficacious in the creation of value. In support of the approach in the current study, these observations are consistent with the seminal works of Dwyer, Schurr & Oh (1987), Morgan and Hunt (1994) and Wilson (1995). By the same token the literature also cautions against the limitations of social constructs to explain business-to-business relationships. Gummesson (1994) referred to a lack of clarity regarding the operational contents of relationship marketing, and Ford, *et al.* (2007) note that little work seems to have been undertaken on establishing what the activities are that lead to the creation and maintenance of a relationship. Moreover, Hennig-Thurau & Klee (1997) question the power of satisfaction to drive customer retention, while Möller & Halinen (2000) argue that some of the novelty and generality claims in relationship marketing propositions are inflated.

Despite the validity of some of the counter arguments, Social Exchange Theory (SET) occupies a prominent position in explaining B2B relationships. Brennen, Canning & McDowell (2007) noted that SET makes a clear contribution to the understanding of exchange relationships as it shows that factors other than pure economic ones apply to relationships. In particular, the role that factors such as trust and commitment play in mediating the satisfaction-loyalty linkage is emphasised. This view is supported by Donaldson & O'Toole (2007) who alluded to the notion that social exchange theory views inter-organisational governance in the context of a social structure where firms are interdependent and rely on reciprocation. Trust and equity are key variables in this implied reciprocity. Furthermore, it is proposed (Donaldson & O'Toole, 2007) that the key drivers of social exchange (trust and commitment) moderate the impact of power and determine the perception of fairness in an exchange relationship.

### **Quality, Satisfaction and Loyalty**

In proposing his "Satisfaction-Loyalty Model" Olsen (2002:242) argues that marketing researchers accept a theoretical framework where quality is employed as a predictor of customer satisfaction. This is based on the notion that if quality is viewed as an evaluation or appraisal of attribute performance, and satisfaction is conceived to be reflective of the impact of performance on an individual's feelings, then quality can be the predictor of satisfaction. This is claimed to be consistent with expectancy theory often employed in consumer research. Importantly, Olsen's (2002) proposition enjoys empirical support. Anderson *et al.* (1994) and Grewal, Monroe & Krishnan (1998) confirmed that product quality has a positive effect on satisfaction and that in turn has a positive effect on performance. Furthermore, Cater & Cater (2010) suggested that in an exchange relationship a product must first exist, so that a relationship can be built around it. Customers do not have the motivation to continue the relationship merely for the relationship itself (or any of its components) unless they receive a product that meets their standards and add value in some way. Ulaga & Eggert (2006) cautions that product quality is merely an entry

condition, and suppliers must meet quality standards to be included in the supplier base. In addition, with ample support from the services marketing literature, Cronin & Taylor (1992), Fornell (1992) and Hallowell (1996) demonstrated the positive effect of service quality on customer satisfaction. These observations allowed for the construction of two hypotheses:

*H1: Perceived product quality positively influences overall satisfaction with the relationship*

*H2: Perceived service quality positively influences overall satisfaction with the relationship*

The relationship between satisfaction and loyalty has benefitted from a plethora of research efforts, including meta-analytical designs, since the early 1990s. To summarise these findings Table 1 reports 4 key notions relevant to the current study and that is core to the study of business-to-business relationships in contemporary literature. Notable from the literature on the Quality-Satisfaction-Loyalty (Q-S-L) chain is the distinction between attitudinal and behavioural loyalty. Cater & Cater (2009 and 2010) define attitudinal loyalty as the level of the customer's psychological attachments and attitudinal advocacy towards the supplier, while behavioural loyalty is defined as the customer's willingness to repurchase the product and to continue a relationship with the supplier. Oliver (1999) argues that loyalty is a dedication by the buyer to remain in a relationship and keep purchasing a product, which suggests the presence of both behavioural and attitudinal components as suggested by Sheth, Sisodia, and Sharma (2000) and Liang & Wang (2006). According to Alejandro *et al.* (2011) there are few studies that have linked the elements of relationship quality to both the behavioural and attitudinal elements of loyalty. This appears consistent with Rauyruen & Miller (2007) who suggest that the three main streams of research on loyalty include behavioural loyalty, attitudinal loyalty and composite loyalty.

**Table 1: Recent findings on satisfaction-to-loyalty B2B relationship**

Examples of typical source of the confirmatory research re the corresponding notion					
	<i>Key notion</i>	<i>Author(s)</i>	<i>Context</i>	<i>N</i>	<i>Publication</i>
Notion 1	A significant positive association exist between customer satisfaction and attitudinal loyalty	Lages, Lancastre & Lages (2008),	Information Technology (Portugal)	395	IMM
		Cater & Cater (2009 and 2010)	Manufacturing (Slovenia)	477	JBIM & IMM
		Palmatier (2008)	Cross-sectional	527	JM
Notion 2	A significant positive association between customer satisfaction and behavioural loyalty	Cater & Cater (2009)	Manufacturing (Slovenia)	477	JBIM & IMM
Notion 3	A significant positive association between relationship satisfaction and objective performance	Palmatier <i>et al.</i> (2006)	Meta-analytical	446	JM
Notion 4	The important role of commitment, and trust as mediators of the relationship between satisfaction and loyalty	Palmatier, <i>et al.</i> (2007)	Cross-sectional (Fortune 500 seller of multiple products)	369	JM
		Cater & Cater (2009)	Manufacturing (Slovenia)	477	JBIM & IMM

*IMM=Industrial Marketing Management; JBIM=Journal of Business and Industrial Marketing, JM=Journal of Marketing*

Motivated by the lack of attitudinal loyalty studies in a South African business-to-business context, it was decided to focus on attitudinal loyalty in this study. In terms of attitudinal loyalty, Garbarino & Johnson (1999) find that trust can create benefits for customers by decreasing transaction costs — ultimately fostering customer loyalty to the relationship. However, trust and

satisfaction are both related to both behavioural and attitudinal loyalty (Chiou, Droge & Hanvanich, 2002). Burton, Sheather & Roberts (2003) find that satisfaction is positively related to repurchase intention and customer loyalty. In a service context, Hennig-Thurau, Gwinner & Gremler (2002) found that satisfaction and commitment are both drivers of loyalty. It should be noted that these implied relationships are subject to a time perspective (Medlin, Aurifeille, & Quester, 2002; Seppänen, Blomqvist & Sundqvist, 2007) and can be expected to change over time. Nevertheless, we expect there to be a positive relationship between relationship satisfaction and attitudinal loyalty and therefore also hypothesise that in the context of an emerging market buyer dyad:

*H3: Relationship satisfaction positively influences attitudinal loyalty*

In the preceding sections we cited studies that in addition to testing the Q-S-L framework, also included constructs that mediate the relationship between satisfaction and loyalty (notably trust and commitment). Therefore, we first operationalize the mediating constructs, before we offer a complete model for the purposes of the empirical investigation.

#### *Trust*

Morgan and Hunt (1994) postulate that trust exists when one party has confidence in an exchange partner's reliability and integrity. Thus, trust may be viewed as an essential ingredient in the creation, development, and maintenance of long-term relationships between buyers and suppliers (Anderson & Narus, 1990; Ganesan, 1994). Many studies prior to 2000 (Dwyer *et al.*, 1987; Morgan & Hunt, 1994; Moorman, Deshpandé, & Zaltman, 1993, Young and Wilkinson, 1989) and post 2000 (Young, 2006; Denize & Young, 2007; Seppänen *et al.*, 2007) have consistently confirmed the importance of trust in business relationships. According to Palmatier *et al.* (2006) this inclusion of trust is of particular relevance because it is the cornerstone of a strategic partnership and the relationship development process. Sin *et al.* (2005) conceptualize trust as the component of a business relationship that determines the level to which each party feels that they can rely on the integrity of the promise offered by the other party. Similarly Doney, Cannon, and Mullen (1998:604) define trust as the “willingness to rely on another party and to take action in circumstances where such actions make one vulnerable to the other party”.

In addition, and consistent with the Morgan & Hunt (1994), Blois (1996) proposes that trust leads to commitment in two ways. First, it is crucial for the development of relationship efficiency. For example, it serves as a substitute for contractual agreements and increases interaction efficiency, thus decreasing transaction costs. This increase of relationship efficiency entails an increased net benefit for the customer (as well as for the supplier), which in turn fosters the cognitive commitment of the customer to the relationship. Second, trust addresses central social needs of the customer, the fulfilment of which leads to an affective commitment to the relationship. Notably, some authors (Medlin *et al.*, 2002 and Seppänen *et al.*, 2007) argue that the research on trust has generally shifted from a level of analysis of individuals to organisations. By contrast Mouzas, Henneberg & Naudé, (2007) showed that trust appears to be more applicable at the level of inter-personal relationships than to inter-organizational relationships. Moreover, Pardo *et al.* (2006) noted that it is possible that in key accounts value can still be delivered in a long-term “transactional” mode (i.e. a succession of transactional episodes or repeated transactions) and a relationship based on trust and commitment may not exist. Also Zaheer & Bell (2005) reported that at an inter-firm level, network closure and the

consequent trust will allow for greater relation-specific investments to be made, and reduce costs involved in monitoring exchange partners. These observations lead Rampersad *et al.* (2010) and McEvily, Perrone & Zaheer (2003) to surmise that despite the attention that trust receives, especially in the field of marketing, it remains under-explored empirically at the network level of analysis. This provides further motivation for the inclusion of trust in the current study as extant studies focus predominantly on organisational or even individual levels of analysis with a single informant.

Despite the shifts in trust research, even recent exchange relationship studies and inter-organisational studies points to the mediating role of trust. Aurier & N'Goala (2010) reported that trust directly influences service usage and cross-buying, and that is critical for service relationship development and company profits. Moreover, they (Aurier & N'Goala 2010) also observed that trust and relationship commitment mediate the entire impact of satisfaction which appears as a necessary but not sufficient condition for relationship maintenance and development. Cater & Cater (2010) showed that in general “social” dimensions such as cooperation and trust have a much greater influence on commitment than its “technical” dimensions such as knowledge transfers and adaptation. Specifically it was also shown that trust positively influences affective, normative and calculative commitment. Palmatier (2008) also reported that sellers of industrial products and their clients in North America indicated that the value generated from inter-firm relationships comes partly from the quality of customer ties - including trust. Moreover, Palmatier *et al.* (2008) confirmed that both trust in the salesperson and the exchange inefficiency mediate the effect of relationship marketing on the firm's financial performance. Considering business-to-business relationships in the financial sector of South Africa, Theron, Terblanche & Boshoff (2008) reported significant positive relationships between satisfaction and trust, and between trust and loyalty. Hence it is hypothesised that:

*H4: Relationship satisfaction positively influences trust in the buyer-seller relationship*

*H5: Trust positively influences commitment*

### *Commitment*

Commitment has been acknowledged in the relationship marketing literature to be an integral part of any business relationship. Relationship commitment is defined as the “desire to develop a stable relationship, a willingness to make short-term sacrifices to maintain the relationship, and a confidence in the stability of the relationship” (Anderson & Weitz, 1992:19). An alternative definition of commitment offered by Morgan and Hunt (1994) proposes that commitment occurs when an exchange partner believes that an on-going relationship with another partner is so important that it warrants the effort to maintain it. Also, Moorman, Zaltman & Deshpande (1992) argue that commitment reflects a desire to sustain and continue a relationship based on the perceived value of that relationship. Thus, commitment is essential for the development of long-term relationships (Anderson, Narus & Narayandas, 2009; Kumar, Scheer, & Steenkamp, 1995), and it is an important indicator of relationship performance (Roberts, Varki, & Brodie, 2003). Moreover, relationship commitment is a means of differentiating successful relationships from unsuccessful ones (Morgan & Hunt, 1994). Suppliers in a committed relationship gain greater access to market information, which enables them to better select their customers (Anderson & Weitz, 1992), and similarly buyers in a relationship require relevant up to date market and product information, better choice, and order/payment terms (Smith *et al.*, 1999). Because both parties receive new benefits from each other, each has a stronger motivation to build, maintain

and develop the relationship through renewed committed efforts. Thus, strong relationships are built on the foundation of mutual commitment.

In opposition to the mainstream research of the role of trust and commitment, Harris *et al.* (2003) emphasize that while trust and commitment have proven insightful in relationship development to date, the lack of a theoretical framework identifying the antecedents of these constructs is a limitation in business-to-business research. This argument (Harris *et al.* 2003) employs the position of Morgan (2000) to maintain that business relationship theory must expand commitment (and trust) theories, and include a framework to shed more light on the processes of and motivations for relationships to start up and develop. Harris *et al.* (2003) then conclude that even though commitment (and trust) are used to explain relationship development and changes in the relationship, a construct that can better explain the future motivation of actors to remain in the relationship is needed (Dwyer *et al.*, 1987; Halinen, 1997; Harris *et al.*, 2003). Nevertheless, Aurier & N'Goala (2010) reported that relationship commitment enhances retention and exclusivity and, together with trust, it mediates the impact of satisfaction. Cater & Cater (2010) not only reported that cooperation and trust positively influence affective and normative commitment, but showed that negative calculative commitment positively influences behavioural loyalty. Similar to their findings on trust, Theron *et al.*, (2008) also reported that satisfaction is significantly positively associated with commitment and in turn commitment is significantly positively associated with loyalty. Therefore, it is theorized that commitment is a key driver of customer value in business-to-business relationships, and the higher the level of commitment between buyer and seller, the greater the probability for loyalty. We hypothesise that given the context of our study:

*H6: Relationship commitment positively influences the attitudinal loyalty of buyers*

### *Information Sharing*

The operationalisation of information sharing is complex because of its proximity to “communication” (Homburg, Müller & Klarmann, 2010; Sin *et al.*, 2005, Grönroos, 1996; Batt & Purchase, 2004) and “knowledge” (Hansen, 1999; Dyer & Singh, 1998; Johnson *et al.*, 2004). In addition, it is used in multiple theoretical approaches. Möller & Halinen (1999) suggested that studies that employed social exchange theory to explain exchange relationships have produced corroborative evidence on the importance of information sharing in attaining customer satisfaction. Also, studies that mostly employ network theory (Walter & Gemünden, 2000) often assume that marketing-oriented boundary spanners need elaborate network knowledge in order to be effective. This knowledge includes essential information regarding the needs, resources, strategies, structures, bonds, and alternatives of an interacting supplier and customer including relevant third parties. Moreover, Information Sharing has been demonstrated to have both mediation (Borgatti and Cross, 2003; Dyer and Singh, 1998; Denize and Young, 2007; Anderson and Narus, 1990) and moderation (Homburg *et al.*, 2010; Wagner *et al.*, 2010) effects in exchange relationships. Hence information influences and is influenced by relational factors, including the motivations of the entity participating in the exchange, the norms of exchange that have developed and the more general nature of the relationships (Hallén, Johanson, & Seyed-Mahamed, 1991).

Information exchange and trust are embedded in and emerge from their interaction with each other (Denize and Young, 2007). They create and are created by each other, suggesting that the



mutual exchange of information is at the heart of this evolutionary process (Ford *et al.*, 2003). The type of information, the way information is transformed, the medium by which it is exchanged, and the transfer of that information mediates the relationship between trust and relational outcomes (Cohen, 2008; Denize & Young 2007; Jayachandran *et al.* 2005; Souchon, *et al.* 2004). Rowley (2004), Bonner & Walker (2004) and Yli-Renko & Janakiraman (2008) also observed that relational embeddedness encourages collaboration and the exchange of rich and complex information. Shared information generates a deeper understanding of customers' problems and needs. Simply, higher levels of embeddedness are associated with higher levels of information sharing. It is therefore conceivable that it is the embeddedness, and the associated higher levels of information sharing, that may discourage customers from leaving the relationship. Subsequently we expect information sharing to mediate the link between relationship satisfaction and attitudinal loyalty and hypothesise that in the context of an emerging market buyer network:

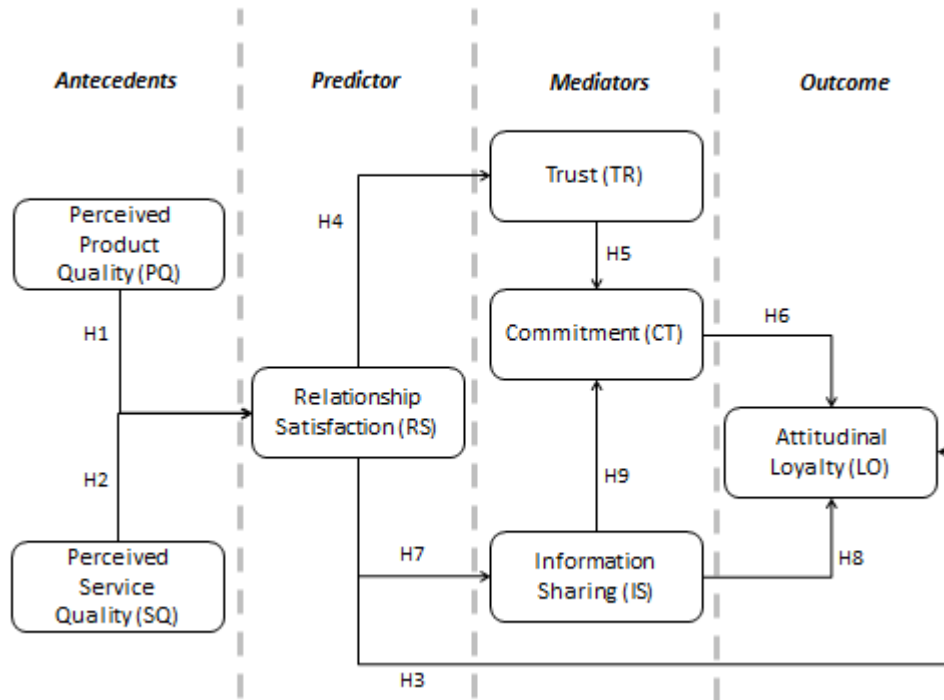
*H7: Relationship satisfaction positively influences information sharing*

*H8: Information sharing positively influences the attitudinal loyalty of buyers*

Furthermore, Siguaw, Simpson and Baker (1998) reported that information sharing is associated with increased commitment in the relationship, while Child, Faulkner & Tallman (2005), Denize & Young (2007), and Kanagaretnam, *et al.*, (2010) demonstrate that trust drives information sharing. Arguably the more and better information the buyer can obtain from the supplier, the more committed one may expect the buyer to be to that particular relationship. Also, the information sharing propensity of both parties is driven by the degree of trust in the relationship. Therefore we also hypothesize that:

*H9: Information sharing positively influences the commitment of buyers to remain in the relationship with the focal seller.*

The hypothesised relationships and the corresponding constructs are presented in a conceptual model in Figure 1. The model depicts product and service quality as antecedents of relationship satisfaction. In turn trust, commitment and information sharing mediates the path between relationship satisfaction and attitudinal loyalty. Consistent with the literature (Morgan & Hunt, 1994) the model also depicts the relationship between trust and commitment and that between information sharing and commitment.



**Figure 1: Conceptual Model**

Despite a myriad of conceptualisations and studies of the Q-S-L framework in business-to-business relationships, most appear to avoid considering the heterogeneity that might be present in such causal chains. Erikson and Mattson (2002) showed that managers perceive that the more heterogeneous the market, the more difficult it is to achieve relationship development. This notion is supported by Auh and Menguc (2009) who indicate that at the intra-firm level, institutional isolating mechanisms determine the level of firms' resource heterogeneity, and therefore, their competitive advantage. Also, Boejgaard and Ellegaard (2010) noted that business-to-business market heterogeneity is driven by: (a) frequent communication, (b) social interaction characterizes the exchange and complicates stimulus-response patterns, (c) the multi-directional nature of communication where customers often stimulate suppliers to a larger extent by communicating needs and wants directly, (d) relations are multiplex, generating multiple stimulus channels, (e) offerings are more complex and frequently developed in interaction, and (f) segments are more unstable. Hence, companies operating in industrial markets face significant implementation complexities compared to those operating in consumer markets. Against this background we also interrogate of heterogeneity in the data and then compare groups by hypothesising a statistically significant difference in each of the estimated paths of the structural model as follows:

*H10a: Gender – Males versus Female buyers*

*H10b: Age – Younger versus Older buyers*

*H10c: Qualifications – Graduate versus Non-graduate buyers*

*H10d: Sector - Private versus Public sector buyers*

*H10e: Managerial Level – Senior versus Junior Managers in the client organisation*

## METHOD

### Data collection

We employed a focal firm approach to obtain access to a network of buyers in the Computer Aided Design (CAD) industry of South Africa. The focal firm is the largest supplier of CAD software in South Africa and its client base covers South Africa as well as most other countries in the Southern African region. First we conducted interviews with three senior managers in the focal firm, including the Marketing Director, and then conducted a focus group discussion with seven buyers with decision-making responsibility for dealing with the focal firm. The objective of this qualitative research was to (a) gain a better understanding of the relationships, including the underlying drivers (constructs) of those relationships, and (b) gain insights into how purchasing and repurchasing decisions are typically made in this market. The research revealed that the relationships are mostly collaborative, but with occasional variability in that some relationships appear more intermistic (Lambe, Spekman & Hunt, 2000). Moreover, it appears that purchasing decisions are mostly team driven and therefore we decided to employ a multi-informant approach for the collection of survey data. Without exception all the buyer participants voiced very strong opinions regarding the importance of the product and service quality that precedes the establishment of a relationship with a supplier. In addition, all the interviewees made reference to the importance of sharing information in the buyer-seller dyad and confirms our inclusion of information sharing as a mediator. Based on prevailing literature and the insights from the qualitative study we develop a measurement instrument and data was collected via two waves in which the survey was administered to 3112 active clients (clients that had interacted with the firm over the previous 36 months and have direct input in the purchase decision). We collected demographic information relating to age, gender, employment, industry and education and administered the multi-item scale (Appendix A) to measure each of the seven latent constructs. From this a total of 497 (16%) responses, representing 255 firms were suitable for further analysis. Therefore, for some firms we had to rely on the opinion of a single respondent.

### Measurement

In the measurement all constructs employed 7 point Likert-type scales with “1 = strongly disagree” and “7 = strongly agree” and negatively stated questions were reversed scored. The measurement instrument consisted of 24 items to measure each of the following latent variables: Perceived Product Quality (PQ) – 3 items based on Matzler (2004), Chakraborty *et al.* (2007) and Zeelenberg & Pieters (2004); Perceived Service Quality (SQ) – 6 items based on Busacacca & Padula (2005) and Matzler (2004); Perceived Relationships Satisfaction (RS) – 4 items based on Lages *et al.* (2008); Trust (TR) – 3 items based on Morgan & Hunt (1994); Commitment (CT) – 3 items based on Palmatier (2008); Attitudinal Loyalty (LO) - 3 items based on Palmatier (2008); Information sharing (IS) – 3 items based on Denize and Young (2007).

## Sample

From an original database of 5000 clients, the focal company assisted in identifying 3112 clients that had exhibited account activity during the previous 36 months. These clients were labelled as active users involved in the purchasing decision of the CAD systems and were subsequently included in our sample. As expected the sample (table 2) is overwhelmingly male (84%), almost 70% are under 45 years of age and (as expected) almost all the respondents are from the engineering domain. Engineering firms and their business partners are the obvious users of CAD systems and this reflects the main market focus of the focal firm. The respondents were all employed in engineering-related fields and involved in making CAD purchasing decisions, but none of them have a specific procurement/purchasing related job title.

**Table 2: Key descriptive statistics of the sample**

<b>N</b>		497
<b>Gender</b>	<i>Male</i>	83%
	<i>Female</i>	17%
<b>Average age</b>		39.5 years
<b>Age distribution</b>	<i>18 - 30 yrs</i>	28%
	<i>31 - 45 yrs</i>	41%
	<i>46 - 55 yrs</i>	21%
	<i>&gt; 55 yrs</i>	10%
<b>Industry</b>	<i>Infrastructure Engineering</i>	159 (32%)
	<i>Multi Industry Applications</i>	129 (26%)
	<i>Civil Engineering</i>	75 (15%)
	<i>Municipal/Local Government</i>	65 (13%)
	<i>Structural Engineering</i>	20 (4%)
	<i>Land Surveying</i>	20 (4%)
	<i>Provincial Government</i>	15 (3%)
	<i>Project Management</i>	15 (3%)
<b>Education</b>	<i>Undergraduate Degree</i>	298 (60%)
	<i>Technical Qualification</i>	119 (24%)
	<i>Post Graduate Degree</i>	80 (16%)

## RESULTS

First we tested for multivariate normality using both descriptive and inferential statistical methods. It was found that each construct exhibits non-normality and hence the sample data exhibits non-normality. Therefore, it was decided to employ partial least squares (Henseler, Ringle and Sinkovics, 2009; Tenenhaus, *et al.*, 2005; Diamantopoulos and Winklhofer, 2001; Chin, 1998; Bollen, 1989) using SmartPLS 2.0 (Ringle, Wende and Will, 2005) to analyse the data. Partial least squares (PLS) was preferred as it is less sensitive to distributional abnormality and allows for smaller samples (Vinzi *et al.* 2010). This analysis was followed by the a Finite Mixture modelling approach in PLS to test for the presence of heterogeneity in the data, and subsequently the procedure suggested by Keil (2000) and Chin (2000) was used to compare the model between groups.

## Measurement model

All items loaded on to the corresponding latent variable structure and all items exhibit loadings greater than 0.62. All constructs exhibit adequate internal consistency reliability as the Chronbach alpha coefficients exceed the 0.7 (table 3) benchmark.

**Table 3: Reliability indicators for the of the measurement model**

	AVE*	Composite Reliability	Cronbach Alpha	R <sup>2</sup>
Commitment (CT)	0.76	0.87	0.78	0.77
Information Sharing (IS)	0.55	0.76	0.70	0.15
Attitudinal Loyalty (LO)	0.59	0.81	0.71	0.65
Perceived Product Quality (PQ)	0.65	0.85	0.72	-
Relationship Satisfaction (RS)	0.50	0.79	0.70	0.55
Perceived Service Quality (SQ)	0.56	0.88	0.83	-
Trust (TR)	0.76	0.89	0.81	0.76

\* AVE = Average Variance Extracted

The Chronbach alpha coefficients for the information sharing and relationships satisfaction ( $\alpha = 0.70$ ) were the weakest of all the reliability measures, but remains acceptable (Nunnally and Bernstein, 1994). All the remaining constructs showed good internal consistency reliability. The measurement model also exhibited significant convergent validity as the cross-loading matrix (Table 4) exhibits no cross loading that exceed the with-in row and column loadings.

**Table 4: Cross-loadings of Items**

	Commitment (CT1-3)	Information Sharing (IS1-3)	Attitudinal Loyalty (AL1-3)	Perceived Product Quality (PPQ1-3)	Relationship Satisfaction (RS1-4)	Perceived Service Quality (PSQ1-6)	Trust (TR1-3)
CT1	0.84						
CT2	0.78						
CT3	0.87						
IS1		0.76					
IS2		0.82					
IS3		0.92					
LO1			0.72				
LO2			0.79				
LO3			0.87				
PQ1				0.90			
PQ2				0.89			
PQ3				0.69			
RS1					0.69		
RS2					0.80		
RS3					0.78		
RS4					0.75		
SQ1						0.75	
SQ2						0.71	
SQ3						0.76	
SQ4						0.81	
SQ5						0.83	
SQ6						0.85	
TR1							0.90
TR2							0.82
TR3							0.84

Discriminant validity is considered in two steps. First, the Fornell & Larcker (1981) criterion is used to test whether the square root of a construct's AVE is higher than the correlations between

it and any other constructs within the model. Second, the factor loading of an item on its associated construct should be greater than the loading of another non-construct item on that construct. Table 5 shows the result of this analysis and reports the latent variable correlation matrix with the AVE on the diagonal. It (table 5) suggests no evidence of multi-collinearity. Therefore we conclude that measurement model exhibits good discriminant validity and meets the Fornell & Larcker (1981) criteria.

**Table 5: Latent variable correlation matrix and descriptive statistics**

	Mean	SD	1	2	3	4	6	7	8
1. Commitment (CT)	5.68	0.89	<b>0.88</b>						
2. Information Sharing (IS)	3.56	1.05	0.34	<b>0.74</b>					
3. Attitudinal Loyalty (LO)	5.45	0.93	0.60	0.31	<b>0.77</b>				
4. Perceived Product Quality (PQ)	5.29	0.91	0.64	0.53	0.56	<b>0.81</b>			
6. Relationship Satisfaction (RS)	5.19	0.87	0.65	0.38	0.56	0.58	<b>0.71</b>		
7. Perceived Service Quality (SQ)	5.77	0.89	0.54	0.31	0.44	0.46	0.66	<b>0.75</b>	
8. Trust (TR)	5.82	0.85	0.67	0.35	0.65	0.63	0.67	0.54	<b>0.87</b>

*Square Root of AVE on diagonal.*

## Structural Model

We estimated all the hypothesised paths between latent variables to ascertain mediation effects and the predictive power of the model. Table 6 reports the results pertaining to each hypothesised relationship.

**Table 6: Results of PLS path analysis**

	Hypothesised Relationship	$\beta$	<i>t</i> -statistic	Result
H1:	Perceived Product Quality → Relationship Satisfaction	0.331	7.667	Supported
H2:	Perceived Service Quality → Relationship Satisfaction	0.530	12.972	Supported
H3:	Relationship Satisfaction → Attitudinal Loyalty	-0.107	1.918*	Rejected
H4:	Relationship Satisfaction → Trust	0.870	63.628	Supported
H5:	Trust → Commitment	0.863	53.568	Supported
H6:	Commitment → Attitudinal loyalty	0.859	24.107	Supported
H7:	Relationship Satisfaction → Information Sharing	0.385	10.524	Supported
H8:	Information Sharing → Attitudinal Loyalty	0.055	1.873*	Rejected
H9:	Information Sharing → Commitment	0.043	2.127	Supported

*All relationships tested at the  $p < 0.05$  level.*

*\* Significant at the 90% ( $p < 0.10$ ) level.*

From Table 6 it is clear that product and service quality drives relationship satisfaction among buyers in this network – hence, H1 and H2 are supported. Moreover, these two constructs accounted for 55% of the variance in relationship satisfaction. Interestingly, (and counter to expectations), the direct relationship between relationship satisfaction and attitudinal loyalty was not supported by the data and therefore H3 is not supported (null could not be rejected). Subsequently, the path between relationship satisfaction and trust was significant and H4 is supported. The relationship between trust and commitment was found to be significant as well as the relationship between commitment and attitudinal loyalty. This observation results in support for H5 and H6. Table 6 also show a significant relationship between information sharing attitudinal loyalty in support of H6. The net effect of these observations is that our data suggests that the link between relationship satisfaction and attitudinal loyalty is fully mediated by the impact of trust and commitment.

Furthermore, H9 is supported as the path between information sharing and commitment is significant, while the direct path between Information sharing and attitudinal loyalty was only significant at the 90% level, thus resulting in the rejection of H8 (null could not be rejected). Similar to the above these findings suggest that commitment fully mediates the relationship between information sharing and attitudinal loyalty. In addition to these findings it appears that the model exhibits substantial power as it explained 77%, 65%, and 76% and of the variance in commitment, attitudinal loyalty and trust respectively. Notably, the model is much weaker in explaining the amount of variance ( $R^2 = 0.15$ ) in the information sharing construct.

### Heterogeneity and Multi-group analysis

Employing the procedure proposed by Ringle, Wende and Will (in Vinci *et al*, 2010) we investigated the presence of heterogeneity in the data that may influence the performance of the model. The FIMIX-PLS analysis (Table 7) confirmed our suspicion of heterogeneity and it appear that most likely the heterogeneity may be explained by two groups ( $EN < 0.5$ ). This result prompted a multi-group analysis to test H10a through H10d

**Table 7: FIMIX PLS analysis for heterogeneity**

Nr of segments	CAIC	EN	Segment size						
			1	2	3	4	5	6	7
2	4978.321	0.465	56.3%	43.7%					
3	5132.436	0.547	11.2%	52.2%	36.6%				
4	5276.542	0.537	42.5%	29.8%	16.1%	11.7%			
5	5425.413	0.509	24.4%	20.8%	18.7%	19.8%	16.3%		
6	5416.809	0.598	26.9%	18.5%	16.2%	13.0%	20.6%	4.8%	
7	5582.878	0.588	31.2%	5.2%	23.2%	15.4%	3.8%	6.8%	14.3%

CAIC = Consistent Akaike Information Criterion

EN = Normed entropy statistic

We followed the procedure proposed by Keil (2000) and Chin (2000) to compare all hypothesised path coefficients in the model (Table 8.1 through 8.5). For all the group analyses only path estimates that were significant at the  $p < 0.1$  (or higher) level in both groups were considered for the comparison between groups. The results of this analysis suggest that significant differences between groups exists, thus confirming the FIMIX-PLS findings. As expected, statistically significant differences (Table 8.1) between gender groups were observed for all paths except for two which were insignificant ( $p > 0.1$ ) for females and one (PQ->RS) that was insignificant ( $p < 0.5$ ), and we could not reject the null hypothesis

**Table 8.1: Gender – Males versus Female buyers (H10a)**

Paths	Male					Female					<i>t</i> <i>p</i> <i>df</i>		
	<i>N</i>	$\beta$	<i>T</i>	<i>P</i>	<i>Se</i>	<i>N</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>Se</i>			
CT -> LO	411	0.86	20.56	0.00	0.04	86	0.85	-	-	-	-	-	-
IS -> CT	411	0.04	1.87*	0.03	0.02	86	0.12	3.09	0.00	0.06	-19.79	0.00	495
IS -> LO	411	0.06	1.64*	0.05	0.03	86	0.11	6.89	0.00	0.06	-11.61	0.00	495
PQ -> RS	411	0.33	6.75	0.00	0.05	86	0.34	1.99	0.02	0.08	-1.10	<b>0.14</b>	495
RS -> IS	411	0.38	9.38	0.00	0.04	86	0.20	3.37	0.00	0.10	27.28	0.00	495
RS -> LO	411	-0.11	1.73*	0.04	0.06	86	-0.14	1.87*	0.03	0.12	4.07	0.00	495
RS -> TR	411	0.87	55.70	0.00	0.02	86	0.89	-	-	-	-	-	-
SQ -> RS	411	0.53	11.54	0.00	0.05	86	0.45	5.76	0.00	0.09	11.98	0.00	495
TR -> CT	411	0.86	46.66	0.00	0.02	86	0.80	2.23	0.01	0.04	20.36	0.00	495

CT= Commitment, LO=Attitudinal Loyalty, IS=Information Sharing, PS=Product Satisfaction, SS=Service Satisfaction, RS=Relationship Satisfaction, TR=Trust.  
 $p > 0.05$ ; \* $p > 0.10$

In case of age, the median (37 years) was used to create two age groups. Table 8.2 shows that all differences in path coefficients were statistically significant at either the 90% or 95% level with the exception of the RS->LO path that were not significant for females, thus not allowing for an inter-group comparison.

**Table 8.2: Age – Younger than 37 years versus 37 years and older (H10b)**

Paths	<37 years					37 years plus)					<i>t</i> <i>p</i> <i>df</i>		
	<i>N</i>	$\beta$	<i>T</i>	<i>P</i>	<i>Se</i>	<i>N</i>	$\beta$	<i>t</i>	<i>p</i>	<i>Se</i>			
CT -> LO	231	0.89	18.98	0.00	0.05	266	0.83	15.62	0.00	0.05	13.01	0.00	495
IS -> CT	231	0.07	2.04	0.02	0.03	266	0.04	1.34*	0.09	0.03	12.49	0.00	495
IS -> LO	231	0.08	1.87*	0.03	0.04	266	0.04	1.28*	0.12	0.04	9.99	0.00	495
PQ -> RS	231	0.31	5.49	0.00	0.06	266	0.34	6.32	0.00	0.05	-6.12	0.00	495
RS -> IS	231	0.37	6.27	0.00	0.06	266	0.42	8.43	0.00	0.05	-10.68	0.00	495
RS -> LO	231	-0.20	2.68	0.00	0.08	266	-0.05	-	-	-	-	-	-
RS -> TR	231	0.83	29.60	0.00	0.03	266	0.89	63.72	0.00	0.01	-28.61	0.00	495
PSQ -> RS	231	0.43	7.11	0.00	0.06	266	0.58	11.56	0.00	0.05	-29.30	0.00	495
TR -> CT	231	0.84	31.99	0.00	0.03	266	0.87	41.15	0.00	0.02	-15.67	0.00	495

CT= Commitment, LO=Attitudinal Loyalty, IS=Information Sharing, PS=Product Satisfaction, SS=Service Satisfaction, RS=Relationship Satisfaction, TR=Trust.  
 $p > 0.05$ ; \* $p > 0.10$

In marketing, educational differences are often associated with varying repurchase intentions (Mittal and Kamakura, 2001). We therefore split the sample into respondents that indicated they have university degrees and those that indicated they have no degree. In this analysis three paths could not be compared between groups, while one path (CT->LO) yielded a statistically insignificant result at the 95% confidence level. All the remaining paths showed statistically significant differences between buyers with degrees and those without degrees.



**Table 8.3: Qualifications – Graduated vs Non-graduates buyers (H10c)**

Paths	Degree					No degree					T	p	df
	N	$\beta$	t	$\rho$	Se	N	$\beta$	t	$\rho$	Se			
CT -> LO	222	0.86	15.06	0.00	0.06	274	0.86	16.08	0.00	0.05	-1.37	<b>0.09</b>	494
IS -> CT	222	0.02	-	-	-	274	0.06	1.85*	0.03	0.03	-	-	-
IS -> LO	222	0.02	-	-	-	274	0.08	1.89*	0.03	0.04	-	-	-
PQ -> RS	222	0.34	5.76	0.00	0.06	274	0.31	5.15	0.00	0.06	5.34	0.00	494
RS -> IS	222	0.42	7.97	0.00	0.05	274	0.36	7.58	0.00	0.05	13.46	0.00	494
RS -> LO	222	-0.08	-	-	-	274	-0.13	1.57*	0.06	0.08	-	-	-
RS -> TR	222	0.89	57.71	0.00	0.02	274	0.85	39.46	0.00	0.02	19.10	0.00	494
SQ -> RS	222	0.51	8.23	0.00	0.06	274	0.56	9.11	0.00	0.06	-9.15	0.00	494
TR -> CT	222	0.86	28.95	0.00	0.03	274	0.87	44.04	0.00	0.02	-3.01	0.00	494

CT= Commitment, LO=Attitudinal Loyalty, IS=Information Sharing, PS=Product Satisfaction, SS=Service Satisfaction, RS=Relationship Satisfaction, TR=Trust  
 $\rho > 0.05$ ; \* $\rho > 0.10$

The business-to-business literature is known for its distinction between private sector and public sector markets. These differences mostly remain at a macro market trait level and rarely take into account the differences that may occur at relational level. Hence, table 8.4 reports the results of comparing private sector to public sector relationships within our focal firm. In this case, three paths (CT->LO, RS->LO and TR->CT) could not be assessed. It is noteworthy that two of these paths (CT->LO and TR-CT) are not significant in the public sector sample, while they are key components of the mediation effect of trust and commitment in the RS->LO relationship of the overall sample. Furthermore, the difference between groups for the IS->CT and SQ->RS relationship were insignificant at the  $\rho < 0.05$  level. All the other path coefficient differences were significant.

**Table 8.4: Sector - Private versus Public sector buyers (H10d)**

Paths	Private sector					Public sector					t	P	df
	N	$\beta$	T	P	Se	N	$\beta$	t	P	Se			
CT -> LO	378	0.84	20.17	0.00	0.04	119	0.93	-	-	-	-	-	-
IS -> CT	378	0.04	1.79*	0.04	0.02	119	0.04	3.09	0.00	0.05	-0.32	<b>0.38</b>	495
IS -> LO	378	0.06	1.88*	0.03	0.03	119	-0.02	6.89	0.00	0.07	16.76	0.00	495
PQ -> RS	378	0.36	6.95	0.00	0.05	119	0.22	1.99*	0.02	0.08	22.33	0.00	495
RS -> IS	378	0.42	10.58	0.00	0.04	119	0.30	3.37	0.00	0.10	19.86	0.00	495
RS -> LO	378	-0.07	-	-	-	119	-0.25	1.87*	0.03	0.11	-	-	-
RS -> TR	378	0.87	55.04	0.00	0.02	119	0.87	-	-	-	-	-	-
SS -> RS	378	0.53	11.32	0.00	0.05	119	0.54	5.76	0.00	0.07	-0.37	<b>0.36</b>	495
TR -> CT	378	0.87	45.71	0.00	0.02	119	0.85	2.23	0.01	0.03	7.47	0.00	495

CT= Commitment, LO=Attitudinal Loyalty, IS=Information Sharing, PS=Product Satisfaction, SS=Service Satisfaction, RS=Relationship Satisfaction, TR=Trust  
 $\rho > 0.05$ ; \* $\rho > 0.10$

Finally we considered the differences between junior and senior managers. Table 8.5 reports three paths that could not be compared because of insignificant ( $\rho > 0.05$ ) path coefficients for the

senior management group. Of the remaining paths only the RS->IS relationship yields insignificant results.

**Table 8.5: Managerial Level – Senior versus Junior Managers in the client organisation (H10e)**

Paths	Junior Management					Senior management							
	<i>N</i>	$\beta$	<i>T</i>	<i>P</i>	<i>Se</i>	<i>N</i>	$\beta$	<i>t</i>	$\rho$	<i>Se</i>	<i>t</i>	$\rho$	<i>df</i>
CT -> LO	291	0.89	19.09	0.00	0.05	206	0.82	15.17	0.00	0.05	14.12	0.00	495
IS -> CT	291	0.06	2.07	0.02	0.03	206	0.02	-	-	-	-	-	-
IS -> LO	291	0.07	1.83*	0.03	0.04	206	0.04	-	-	-	-	-	-
PQ -> RS	291	0.29	5.43	0.00	0.05	206	0.39	5.74	0.00	0.07	-16.88	0.00	495
RS -> IS	291	0.39	8.66	0.00	0.04	206	0.38	6.67	0.00	0.06	1.20	<b>0.12</b>	495
RS -> LO	291	-0.18	2.25	0.01	0.08	206	-0.01	-	-	-	-	-	-
RS -> TR	291	0.85	42.37	0.00	0.02	206	0.90	58.79	0.00	0.02	-29.32	0.00	495
SQ -> RS	291	0.55	10.66	0.00	0.05	206	0.51	8.77	0.00	0.06	9.09	0.00	495
TR -> CT	291	0.85	41.97	0.00	0.02	206	0.87	31.35	0.00	0.03	-9.13	0.00	495

CT= Commitment, LO=Attitudinal Loyalty, IS=Information Sharing, PS=Product Satisfaction, SS=Service Satisfaction, RS=Relationship Satisfaction, TR=Trust  
 $\rho > 0.05$ ; \* $\rho > 0.10$

## DISCUSSION

The Q-S-L paradigm is a core element of modern relationship marketing. Yet, evidence to account for the heterogeneity in such causal models is often avoided by researchers. Our research contributes to filling this void and contributes especially to emerging market literature where heterogeneity is often claimed. The research suggests that the mediation effects of trust, commitment and information sharing on the relationship between satisfaction and loyalty frequently observed in mature markets can be expected to play a similar role in an emerging market context. Our results confirmed that the perceived quality of products and services drives relationship satisfaction (consistent with Olsen, 2002; Anderson *et al.*, 1994; Grewal *et al.*, 1998) as it explained more than 50% of the variance in satisfaction. This finding is consistent with the observations made during the qualitative phase of the research and underlines the importance of products/services in industrial markets. However, we caution against the over generalisation of the result as our research is limited to an engineering (and related industries) market. It is conceivable, but rather unlikely, that a different orientation might be found in other industries.

The observed relationship between satisfaction and attitudinal loyalty is fully mediated by trust and commitment. Moreover, our results suggest that relationship satisfaction drives trust, which in turn drives commitment. Then commitment drives attitudinal loyalty. This finding confirms the mediation power of trust and commitment as suggested by many authors (Anderson & Narus, 1990; Kumar *et al.*, 1995; Morgan & Hunt, 1994; Alejandro *et al.*, 2011; Rajamma *et al.*, 2011; Aurier & N'Goala, 2010; Cater & Cater, 2010; Palmatier *et al.*, 2008). In particular our findings regarding the mediation effect of trust and commitment demonstrates the universality of the phenomena as these effects were observed in an emerging market context. In particular the model explains 75%, 77% and 64% of the variance in trust, commitment and loyalty

respectively. Clearly sellers can build attitudinal loyalty by seeking to build trust and commitment in the relationship.

Our results also show support for information sharing as a mediator in the relationship between satisfaction and loyalty. This concurs with the findings of Borgatti & Cross (2003), Dyer & Singh (1998), Denize & Young (2007) and Anderson & Narus (1990). Moreover, we showed that commitment partially mediates the relationship between information sharing and attitudinal loyalty. Although the effect of information sharing is rather small ( $\beta=0.043$  for information sharing on commitment), it is significant in our model. This underscores the importance of information sharing between buyers and suppliers to build commitment and ultimately enhance customer loyalty. Again we caution against its generalisation, but despite its small effect, the impact of information sharing on attitudinal loyalty is conceivable. As buyers receive more information about products, future developments etc., they become more familiar with the supplier and/or feel more at ease with the abilities of the supplier, and as a result have more reason to remain in the relationship.

The above mentioned relationships are, however, subject to heterogeneity. Our results have shown that both actor characteristics (age, gender, managerial level, education) and market characteristics (private versus public sector) can influence the performance of the model to varying degrees. The model show most significant differences between males and females, and firms will do well to not assume males and female customers progress from satisfaction to loyalty in the same way or at the same rate. Moreover the data suggests that a similar situation regarding the age of customers may cause heterogeneity in the data. In general, it appears that one standard deviation of change in any of the components of the model for older customers results in a greater change in attitudinal loyalty than that of what an equal change in the young group would have. In short this suggests that older clients are more fickle and more likely to change their attitudinal loyalty.

Consistent with prevailing literature (Mittal & Kamakura, 2001) it also appears that varying educational levels of customers can influence the Q-S-L chain. Although this difference between groups did test as significant, the effects seem rather small. These differences might well be context specific, as CAD software is highly specialised and requires a minimum level of skill to operate effectively. The results for differences between groups based on managerial level in the customer organisation is varied, but generally seems to suggest that junior and senior managers respond differently to changes in satisfaction levels via the social exchange mechanism assumed in this model. Finally, the data suggests sectorial differences between public sector client and private sector clients. Consistent with prevailing business marketing literature, this variance between the two sectors, suggest that firms need to distinguish between these private sector and public sector relationships and develop specific relationship strategies for each group.

## **LIMITATIONS AND FUTURE RESEARCH**

The context specificity of the measurement dictated by a focal firm approach limits our ability to generalize results of this research. The high tech environment of CAD systems and the associated engineering applications may well represent a particular conceptualisation of

business-to-business relationships. Future studies might employ cross-sectional design methodologies which could improve the generalizability of the results. Because of the heterogeneity commonly found in emerging markets, we did not test for common method bias in this study. Often typical causes of common method bias such as consistency and social desirability (Podsakoff *et al.*, 2003) is minimal in highly heterogeneous samples. However, we acknowledge that results from emerging market studies may well be inflated because of common method bias and suggest that future studies employ the procedure suggested by Lindell & Whitney, (2001) and Liang *et al.*, (2007) to test for common method bias. Moreover, a random sample based on a across-sectional design may also yield better multi-variate normality which can facilitate the use of robust covariance based structural equation modelling analysis.

We included mediation constructs that were of particular importance in a South African context and as dictated by the prevailing literature. These were not intended to be exhaustive and may be expanded upon. While Information Sharing was emphasised in particular during the qualitative phase of the research, other constructs such as Cooperation and Adaptation (Cater and Cater, 2010), Relationship Specific Investments (Palmatier *et al.*, 2007), Relational Embeddedness (Rindfleisch & Moorman, 2001) may well be relevant, even in an emerging market context. In addition, by considering Behavioural Loyalty (Cater & Cater, 2010) future studies may obtain a more complete picture of the loyalty construct. Finally, from the literature it is clear that many of the constructs employed to explain business-to-business relationship share conceptualisation. Future research may assist in isolating constructs more distinctly with obvious benefits for constructing parsimonious models.

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## APPENDIX A

### Summary of scales and descriptive psychometric information

	Mean	Standardized Loading	t-value
<b>Perceived Product Quality</b> - Matzler (2004), Chakraborty et al. (2007) and Zeelenberg & Pieters (2004): $\alpha = 0.72$ ; AVE = 0.65; Mean = 5.20; SD = 0.91			
PQ1: ABC products are cutting edge.	5.98	0.90	53.39
PQ2: The software purchased from ABC has met my expectations.	5.93	0.89	48.40
PQ3: ABC products provide all the functionality I need.	3.97	0.61	15.75
<b>Perceived Service Quality</b> – Busacacca & Padula (2005) and Matzler (2004): $\alpha = 0.83$ ; AVE = 0.56; Mean = 5.77; SD = 0.89			
PQ1: We get visited frequently enough by ABC account managers.	5.31	0.72	26.53
PQ2: I feel that it is easy to lodge complaints with ABC.	5.41	0.73	27.33
PQ3: I am happy with the time taken to reach a support consultant.	5.86	0.79	27.52
PQ4: I am happy with the time ABC take to solve my problem.	5.79	0.82	35.93
PQ5: The ABC technicians are helpful.	5.91	0.86	45.18
PQ6: ABC technicians are experts.	5.87	0.87	42.34
<b>Relationships Satisfaction</b> – Larges et al. (2008): $\alpha = 0.70$ ; AVE = 0.50; Mean = 5.19; SD = 0.87			
RS1: Overall we are satisfied with ABC.	5.86	0.87	54.42
RS2: We are pleased with what ABC does for us.	5.34	0.62	14.02
RS3: Both us and ABC contributes to the relationship.	5.75	0.80	30.15
RS4: I enjoy interacting with ABC	5.04	0.76	18.10
<b>Trust</b> – Morgan and Hunt (1994): $\alpha = 0.81$ ; AVE = 0.76; Mean = 5.82; SD = 0.85			
TR1: ABC can be trusted.	5.91	0.91	91.91
TR2: ABC can be counted on to do what is right.	5.71	0.81	33.25
TR3: ABC has high integrity.	5.84	0.85	35.15
<b>Commitment</b> – Palmatier (2008): $\alpha = 0.78$ ; AVE = 0.76; Mean = 5.68; SD = 0.89			
CT1: We are willing to go the extra mile to work with ABC.	5.59	0.8415	54.23
CT2: We are committed to maintain our good relationship with ABC.	5.75	0.7931	32.52
CT3: We view the relationship with ABC as a long-term partnership.	5.71	0.859	53.06
<b>Information sharing</b> – Denize and Young (2007): $\alpha = 0.70$ ; AVE = 0.55; Mean = 3.56; SD = 1.05			
IS1: ABC shares information with us that helps our decision making.	2.57	0.36	4.07
IS2: I provide ABC with feedback about my experience with their products or services.	4.15	0.82	25.08
IS3: Our firm shares information with ABC to enhance their commitment to the relationship.	3.96	0.92	59.76
<b>Attitudinal Loyalty</b> - Palmatier et al. (2008): $\alpha = 0.71$ ; AVE = 0.59; Mean = 5.45; SD = 0.93			
LO1: We plan to do more business with ABC.	4.81	0.62	14.41
LO2: It is unlikely that we will terminate or relationship with ABC.	5.97	0.78	23.54
LO3: If ABC sold other products I needed, I would first consider them before looking at another supplier.	5.58	0.87	90.84