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Operational antecedents and achieving preferred customership for improved information sharing and supplier involvement in new product introduction

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Abstract

Purpose – The purpose of this research is twofold. First, it aims to identify relevant antecedents of information sharing and early supplier involvement for a case-company in The Netherlands. It uses the social exchange theory as a framework to explain how these antecedents relate to either information sharing and/or early supplier involvement. Second, it makes an attempt to contribute to an already established framework on preferred customer status, supplier satisfaction, and customer attractiveness. By including information sharing in this model further insights can be gathered on the relationship between supplier satisfaction or customer attractiveness contributes and information sharing.

Research Design – This study applies a mixed-methods approach. It starts with an extensive review of the literature in which antecedents for both information sharing and early supplier involvement were identified. Hereafter the processes of the purchasing department of the case-company were analysed based on which an initial advice was established. Lastly, a quantitative questionnaire was send to the suppliers of the case company including questions on preferred customer status, the SET variables, and information sharing. The results were analysed using a multivariate statistical method: SEM-PLS.

Findings – The results of this research show shared norms have a positive direct effect on information sharing. Furthermore it shows information sharing has a positive effect on customer attractiveness. As a part of this research a previous model on supplier satisfaction is replicated wherein information is included as additional variable. In this model information sharing directly influences relational behaviour, and so, indirectly influences supplier satisfaction.

Implications – The literature review of this study can be used by managers as a guide to find out how information sharing or early supplier involvement theoretically be improved. The empirical findings acknowledge that establishing trust and shared norms in a relationship improves information sharing. Furthermore, as the results show, making improvements in information sharing increases supplier satisfaction and customer attractiveness, it can be used as a means to improve the competitive position on the supply-side of the market. This research also has theoretical implications whereas it includes a replication of an early model on the antecedents of supplier satisfaction and its effect on preferred customer status and it provides insights on the

relationship between a social exchange relationship, information sharing, and early supplier involvement.

Management summary

Due to pressures from the market, the supply chain landscape has changed. Increasing global competition forced organizations to be more flexible, cut costs, and increase quality. In combination with the increasing complexity of products, organizations are no longer able to achieve these competitive advantages on their own. By means of outsourcing they create a network of suppliers around them which empowers them to focus on core activities. Consequently, more aligned and closer coordination among organizations within this network is required, putting emphasis on information sharing and collaborative efforts. With regards to collaborative efforts this research focusses especially on buyer-supplier collaboration in early supplier involvement. Information sharing includes both the sharing of information on availability and inventory levels, as well as technical information and information on processes that are relevant to new product introduction.

By means of a model on preferred customer status lastly reviewed by Vos et al. (2016) and a thorough review of literature on the social exchange theory and information sharing, we identified different possible antecedents of both information sharing and early supplier involved. Based on this review several hypotheses regarding the relationship between information sharing, early supplier involvement, aspects of the social exchange theory, and preferred customer status are formulated and statistically tested. As an addition the model of Vos et al. (2016) is replicated and expanded by the extra variable: information sharing. Based on these tests and the literature review we will be able to conclude on the most significantly important antecedents of information sharing and early supplier involvement.

This study was not able to empirically prove that any of the antecedents established from the literature had a significant impact on supplier involvement. However, it was able to find empirical evidence for shared norms to have a positive influence on information sharing. Just as it was able to find support for the importance on information sharing as it positively influences both customer attractiveness and relational behaviour.

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Index of abbreviations

NPI	New product introduction
NPD	New product development
ESI	Early supplier involvement
EDI	Electronic data interchange
ERP	Enterprise resource planning
SET	Social exchange theory
PCB	Printed circuit board

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1 The rising importance of buyer-supplier relationships for performance improvement

1.1 Increased outsourcing as a result of the manufacturing shift emphasizes the importance of information sharing and early supplier involvement

Until the 1970s companies were highly vertically integrated, meaning a large share of the activities was performed in house. As companies increasingly started outsourcing non-core activities this changed. An example of this development is IBM.[1] IBM traditionally produced its own central processing units, which were used for the production of its own computers, and they finally sold these computers with their own operating system running it. Nowadays IBM outsources the production of the computers and operating systems enables itself to focus on its core activity. These changes did not happen all at once.[2] Hätönen and Eriksson (2009) define three different eras in which outsourcing developed.[3] The first wave is referred to as the era of the big bang which lasted until the end of the 1980s. Back then, the main motivator behind outsourcing was cutting costs. The relationships with suppliers were mainly transactional and therefore the outsourced products had a structured and well defined manufacturing process. The second wave, the era of bandwagon, lasted from the early 1990s until early 2000. Global competition has put pressure on organizations to produce more efficiently. In addition, the availability of digital communication methods created other opportunities for outsourcing.[4] Therefore popularity of outsourcing increased. During this period, the relationships with suppliers evolved from transactional to strategic, and the outsourced objects were strategically important to the organizational processes. The last wave, which started in the early 00's and is still lasting, views outsourcing as a means for organizational transformation. Instead of focussing on learning how to make things, companies now aim to learn how not to make things.[5] So, companies use outsourcing as a way to focus on core activities and thereby achieve competitive advantage.

[1] See Hätönen and Eriksson (2009), p. 143.
[2] See Hätönen and Eriksson (2009), p. 143.
[3] See Hätönen and Eriksson (2009), p. 143-145.
[4] See Clegg (2005), p. 3.
[5] See Vankatesan (1992), p. 98.

As a result, buyers rely heavily on suppliers and the complexity of supply chains increase. To be able to efficiently coordinate these complex supply chains more aligned actions are required.[6] By means of early supplier involvement (ESI), in which both the buyer and supplier are responsible for the development of products or services, key or strategic suppliers' competences are integrated in the supply chain of operations of the buyers.[7] This can result in several benefits for the buyer: (1) prototypes can be developed in earlier stages and so the cycle of design, testing, and re-design shortens;[8] (2) it can improve design quality[9] that enables standardization of components and reduced engineering changes and product complexity;[10] and (3) defects can be detected earlier in the design process because of the specialized knowledge of the supplier.[11] Despite these beneficial outcomes not every company utilizes its supplier base for product development. One of the widely discussed reasons for this in the literature is the lack of trust which holds companies back to share sensitive information.[12] Other reasons proposed by R.. McIvor and Humphreys (2004) are incompatibility of systems; difference in power; mismatch in culture; no commitment from top management; costs of information sharing; and lack of clarity and inconsistencies in the policy guidelines for the level and moment of supplier involvement.[13]

Another effect of companies using outsourcing as a strategy for value creation and competitive advantage is the increased importance of information sharing. Shared information can regard technology intensive knowledge, which is important for new product introduction[14], or for example information on inventory levels or forecasts which can be used to lower inventories across the supply chain. Despite the different types of information there is a general agreement on the relevance of information sharing. Therefore, Huang, Lau, and Mak (2003) acknowledge

[6] See Parker, Zsidisin, and Ragatz (2008), p. 71.
[7] See Dobler and Burt (1996), p. 30; as well as Dowlatshahi (1999), p. 4119; and Wynstra, van Weele, and Weggeman (2001), p. 158.
[8] See Bonaccorsi (1994), p. 136.
[9] See Wasti and Liker (1997), p. 151; and Schiele (2010), p. 139
[10] See Bonaccorsi (1994), p. 137; as well as Kaipia and Turkulainen (2017), p. 122.
[11] See Bonaccorsi (1994), p. 138-139.
[12] See Wasti and Liker (1997), p. 338; as well as Petersen, Handfield, and Ragatz (2005), p. 373; and Fliess and Becker (2006), p. 42.
[13] See R.. McIvor and Humphreys (2004), p. 196.
[14] See Petersen et al. (2005), p. 376.

the debate is not about whether to share information or not, but about how to share the right information at the right time, in the right format, by the right people.[15] It can create opportunities for supply chain partners to work collaboratively and remove inefficiencies and increase supply chain responsiveness[16] as well as improve product quality[17], reduce costs of protecting against opportunistic behaviour,[18] enable better decision making[19] and improve product flow integration[20]. In order to improve the quality of information sharing long-term relationship orientation, network governance, and information technology foster inter-organizational communication are important variables.[21] Furthermore a collaborative relationship has to be created in which partners trust each other and the power is balanced.[22]

1.2 Social exchange theory (SET) and preferred customership as theoretical framework

One of the goals of this research is to define and explain the most important variables that determine the success or failure of information sharing and early supplier involvement. When searching for an appropriate theoretical framework in literature on buyer-supplier relationships with a focus on collaboration or information sharing, multiple appropriate theories can be found. Where the Resource Based View uses an individual firm as the unit of analysis, the relational view extents this research by considering the dyadic relationship between firms as unit of analysis.[23] It incorporates aspects like supply base reduction, long-term relationships, communication, and supplier involvement and argues how these aspects contribute to generating relational rents.[24] However, it does not take into account the underlying reasons for a firm to participate in a relationship like the Social Exchange Theory (SET) does. [25] As we want to get to the roots of the questions why firms share information and early involve each other in development processes the theoretical framework of this research is based on SET. SET

[15] See Huang et al. (2003), p. 1484.
[16] See Hsu, Kannan, Tan, and Keong Leong (2008), p. 305.
[17] See Fawcett, Osterhaus, Magnan, Brau, and McCarter (2007), p. 360.
[18] See Paulraj and Chen (2007), p. 4
[19] See Surati and Shah (2014), p. 1749.
[20] See Prajogo and Olhager (2012), p. 520
[21] See Paulraj, Lado, and Chen (2008), p. 57.
[22] See Surati and Shah (2014), p. 1758-1761
[23] See Chen and Paulraj (2004), p. 121.
[24] See Mei Cao and Zhang (2013), p. 19-20.
[25] See Mei Cao and Zhang (2013), p. 21.

provides us a valuable theoretical lens that can inform our understanding of the complex buyer-supplier relationships. [26] A key element in this theory is reinforcement, also referred to as reciprocity: the two-sided rewarding process that involves voluntary exchanges which are chosen on the assumption of rationality. [27] Based on these exchanges SET assumes that relationships evolve over time into trusting, loyal, and mutual commitment.[28] A social exchange relationship thus will produce positive attitudes towards one another characterized by trust, commitment, reciprocity, and relative dependence. [29] By means of these characteristics we are able to use this framework for explaining how and why certain variables have a positive or negative influence on information sharing and early supplier involvement.

In addition to the SET-variables: trust, commitment, reciprocity and relative dependence, this study will also take into account preferred customer status as a variable that contributes to enhancing information sharing and early supplier involvement. Nowadays, the body of literature on preferred customer status is growing. As mentioned before, buyer-supplier relationships are increasingly used as a source of value creating. To acquire benefits of supplier relationships, supplier satisfaction and preferred customer status are essential to the buyer.[30] In addition, the number of suppliers decreases and thereby the competition on the supply-side increases. Consequently, suppliers are able to select the customers they want to work with and so it is not always possible for every customer to access prime resources.[31] This forces the buyers to generate an advantage over competitors on the supply side and thereby receive preferred customer status.[32] A buyer with a preferred customer status gains early access to supplier resources.[33] Furthermore it receives a preferential treatment that includes benefits like early access to innovations[34], better prices[35], and delivery in times of scarcity[36].[37]

[26] See Aminoff and Tanskanen (2013), p. 166 ; as well as Tanskanen (2015), p. 578.
[27] See Emerson (1976), p. 336.
[28] See Cropanzano and Mitchell (2016), p. 875.
[29] See Cropanzano and Mitchell (2016), p. 882; as well as Wu, Chuang, and Hsu (2014), p. 123.
[30] See Vos et al. (2016), p. 4613..
[31] See Vos et al. (2016), p. 4613.
[32] See Hüttinger, Schiele, and Schröer (2014), p. 697.
[33] See Hüttinger et al. (2014), p. 697.
[34] See Schiele, Veldman, and Hüttinger (2011), p. 16.
[35] See Schiele et al. (2011), p. 16.
[36] See Baxter (2012), p. 1255.
[37] See Vos (2017), p. 3.

The literature on preferred customership also provides insights in important variables that influence the buyer-supplier relationship and is therefore of value to this research. According to Bemelmans, Voordijk, Vos, and Dewulf (2015) one of the benefits of preferred customer status is that a buyer and supplier will grow closer together and thereby their interactions will intensify.[38] Whereas these interactions, earlier referred to as exchanges, intensify, we assume that becoming a preferred customer enhances the establishment of a social exchange relationship, and thus both information sharing and early supplier involvement are likely to increase. Furthermore being a preferred customer can offer an advantage in terms of access to the best personnel of a supplier for development and customization of products.[39] Steinle and Schiele (2008) mention that especially during an early supplier involvement project in which suppliers are not assured of a share of the production volume for required materials they are most likely only willing to invest resources, such as their best personnel, in their project. We therefore suggest that achieving a preferred customer status increases the chances a supplier is willing to invest in new product introduction projects of its customer.

1.3 Introduction of the case company and research questions

For the purpose of this research, it will be applied to a case-company. The case company is founded in Texas, 1979, and grew to a global organization having 18 locations across the United States, Asia and Europe. It operates as a sub-contractor by developing and/or manufacturing high-tech components like printed circuit boards for the following markets: (1) Defence; (2) medical technologies; (3) aerospace; (4) industrial; (5) computing & networking; (6) semiconductor capital equipment; and (7) commercial. According to its mission: "…be the solutions provider of choice for High Technology OEM Customers, anticipating their needs and rapidly delivering comprehensive value-creation solutions during the entire Product Life Cycle, the case company does not only manufactures products but also supports its customers during the engineering process and with supply chain & logistics management. One of the key characteristics of the case company is that it does not produce its own products, but only develops and manufactures products on request of its customers.

[38] See Bemelmans et al. (2015), p. 183-184.
[39] See Steinle and Schiele (2008), p. 11; and Bemelmans et al. (2015), p. 183-184.

This research mainly focusses on the purchasing department of one of its sides in Almelo. Together with the side in Brasov, Romania, it covers the European market. Brasov is the location for high volume manufacturing with lower technological advancement where Almelo has a manufacturing department at which mainly highly technologically advanced products in lower volumes are as well as a design & engineering department at which products in request of customers are designed and developed. This side has ten different customers for which it manufactures products and thus has to select suppliers, maintain supplier relationships, and purchase materials. As a result the purchasing department is responsible for buying over 20.000 different components which account for €45.000.000 at over 300 different suppliers. To make this possible different functions are covered: operational purchasers who perform the placing of orders, tactical purchasers who place orders but are also expected to deal with some minor price negotiations, and strategic purchasers who are responsible for overall negotiations with suppliers, a supply chain manager who is the link between planning and purchasing, supplier development engineers who are responsible for the quality and development of suppliers as well as for auditing the quality of potential suppliers, and the chief purchase officer.

Unfortunately, the unique combination of having a design & engineering and manufacturing department as a subcontractor does bring its challenges. In some cases the design & engineering department develops a product of which not all specifications are clear yet since the requirements of customers keep changing. This makes it hard for the engineers to translate these unclear product requirements to the purchasing department and potential suppliers. Consequently, suppliers are less willing to produce these materials, since this creates uncertain situations for production processes and production costs. A solution to this problem now is to produce these materials in house. Whereas this does not fit to the core activities of the case company, the purchasing department is looking for a more sustainable and profitable solution. Another issue on the agenda of the purchasing department is information sharing. Suppliers do not naturally share information that is perceived as relevant by the case company. This study suggests that establishing a stable social exchange relationship with a supplier, as well as achieving a preferred customer status, will result in improved information sharing and early supplier involvement. Whereas being treated as a preferred customer gives a customer access to a supplier's innovations and best personnel, literature on preferred customer status will be used as a theoretical framework, complemented by the social exchange theory and early supplier

involvement literature. Based on theory several hypotheses will be established that will be tested by means of a questionnaire for suppliers and a questionnaire for the buyers at the case company. Based on these results practical suggestions to improve the relationships with suppliers and enhance information sharing and early supplier involvement will be defined and thereby an answer will be provided to the following two research questions:

To what extent do trust, commitment, reciprocity, and shared norms influence supplier involvement and information sharing at the case company?

To what extent do preferred customer status and information sharing relate to each other?

Besides offering a practical contribution to the case company, it aims to provide general managerial implications by generally defining antecedents of information sharing and early supplier involvement and measuring the importance of these variables. As for theoretical contributions this research aims to expand the framework of Vos et al. (2016) by including information sharing as additional variable. Furthermore we aim to provide additional empirical evidence in the relationship between the social exchange theory variables, information sharing, and early supplier involvement.

This paper proceeds as follows. First a literature review will be presented. In this preferred customers status and the social exchange theory, as well as early supplier involvement, information sharing, and its operational failure and success factors are discussed. This review is concluded by several hypotheses and a model of the operational variables. Based on this an initial analysis of the processes at the case company will be performed. Hereafter the research method is set out, followed by the results of this study. In the last section the results are discussed and evaluated, and suggestions for future research are provided.

2 A social exchange framework – evolving buyer-supplier relationships towards supplier satisfaction and preferred customer status

2.1 Buyer-supplier relationships: From arms-length relationships towards preferred customer status, ESI and information sharing

Several explanations for the transition of transactional relationships towards strategic long-term collaborative relationships can be found in literature. First, western organizations follow the

successful Japanese production and supply practices in which there is a focus on long-term collaborative relations with suppliers.[40] Second, the increasing pressures caused by global competition that require organizations to increase product quality, become more flexible, lower costs, and shorten lead times, competitive factors organizations can no longer achieve when acting alone.[41] Or third, the increased use of outsourcing resulting in complex supply chains that requires more aligned actions among organizations in order to be able to coordinate the product and information flows across the supply chain.[42] Although the ambiguity in reasons why, agreement exists upon the fact that the trend of increasing long-term collaborative relationships exist. M. Cao and Zhang (2011) define buyer-supplier collaboration as: "(…) a partnership process where two or more autonomous firms work closely together to plan and execute supply chain operations toward common goals and mutual benefits"[43]. A somewhat similar definition is proposed by Soosay and Hyland (2015): "(…) multiple firms or autonomous business entities engaging in a relationship that aims to share improved outcomes and benefits"[44]. More precise definitions can also be found in the literature: "(…) ongoing relationships between two firms involving a commitment over an extended time period and a mutual sharing of information and the risks and rewards of the relationship"; and "(…) a high level of purposeful bilateral engagement that is characterized by information exchange, cooperation and management involvement in the relationship"[45] Based on these definition we can conclude on some characteristics of collaboration in buyer-supplier relationships. Business partners work closely together towards the same goals for a longer period of time, risks as well as the rewards resulting from the relationship are shared, and it requires cooperation, commitment, information sharing, and management involvement.

A form of buyer-supplier collaboration central to this research is supplier involvement in new product introduction. By means of early supplier involvement key or strategic suppliers' capabilities and resources are integrated in the supply chain or operations of the buyer during the development stage of a product.[46] It is defined as: "(…) the extent to which a buyer

[40] See Bensaou (1999), p. 35.
[41] See Soosay and Hyland (2015), p. 613.
[42] See Parker et al. (2008), p. 71.
[43] M. Cao and Zhang (2011), p. 164.
[44] Soosay and Hyland (2015), p. 613.
[45] See Narayanan, Narasimhan, and Schoenherr (2015), p. 142.
[46] See Dobler and Burt (1996), p. 30; as well as Dowlatshahi (1999), p. 4119; and Wynstra et al. (2001), p. 158.

organization shares responsibility with a supplier organization for the development and design of the subsystems (or components) of a new product".[47] So, both the buyer and supplier are likely to have certain demands going into the development project such as issues regarding product design or base technologies. To ensure the greatest possible integrity of the product, they have to understand each other's technical, budgetary, and organizational realities, in order to fashionably adapt to each other.[48] Successful early supplier involvement thus requires two-way information sharing, including information on the organizations well-being as well as its competences and technological information. So, in early supplier involvement information sharing is key. Carr and Kaynak (2007) describe information sharing in this context as the sharing of information between buyers and suppliers, which is detailed, frequent, and timely enough to meet a firm's requirements.[49] Hsu et al. (2008) refer to external information sharing as information sharing within the supply chain and define it as: "(…) the integration of information systems, and business processes, used to conduct information searches, manage business operations, monitor business details and perform other business activities".[50] Combining these two definitions results in the following definition which is adopted by this research: sharing information which is detailed, frequent, timely enough, and meets the companies' requirements, by integrating information systems or business processes. In order to identify important antecedents to achieve early supplier involvement and information sharing, a frequently used framework in buyer-supplier relationships, the social exchange theory, will be discussed next.

2.2 Social exchange factors that help creating a better buyer-supplier relationship

2.2.1 An SET framework

The social exchange theory posits people behave in ways that maximize their benefits and minimize their costs.[51] Consequently reinforcement is the most fundamental point of departure. Reinforcement in this context is the two-sided rewarding process involving voluntary transactions or exchanges which are chosen on the assumption of rationality.[52] Besides its

[47] Hoegl and Wagner (2016), p. 531.
[48] See Hoegl and Wagner (2016), p. 533.
[49] See Carr and Kaynak (2007), p. 350.
[50] Hsu et al. (2008), p. 297.
[51] See Molm, Takahashi, and Peterson (2000), p. 1398.
[52] See Emerson (1976), p. 336.

significant influence in SET, reinforcement plays an important role for several other concepts of SET as well[53]: (1) for 'reward', which is basically a synonym of positive reinforcement with the added connotation of being socially administered; (2) to 'resources', these are abilities or possessions of an actor which enables him to reward or punish another factor; and (3) for value', which is "the magnitude of reinforcement affected by that unit"[54]. Based on the exchanges, SET assumes that relationships evolve over time into trusting, loyal, and mutual commitments.[55] However, all parties of this relationship have to obey the rules and norms of the exchange which are the "normative definition of the situation that forms among or is adopted by the participants in an exchange relation"[56] to achieve such a relationship. Once a social exchange relationship is established this will produce effective behaviour and positive attitudes towards the other party characterized by trust, commitment, reciprocity, justice, relative dependence, and power.[57] According to Wu et al. (2014) these six variables can be reduced to the following: trust, commitment, reciprocity, and power. This assumption is based on the definitions from Griffith, Harvey, and Lusch (2006) that highlights the interdependency of reciprocity and justice: "(…) a partner receiving a valued contribution develops a sense of obligation and reciprocates with appropriate responses in a justice manner"[58], and relative dependence and power: "(…) the relative dependence between two partners in an exchange behaviour determines their relative power"[59].

Next to its relevance in practice it also provides a valuable theoretical lens which can inform our understanding of complex buyer supplier relationships whereas much of the value creation in these relationships is non-contractual.[60] Accordingly, previous studies have proved the value of SET as a theoretical framework in several ways. For example Jeong and Oh (2017) argue SET allows theorists or managers to model non-economic, socio-psychological outcomes in understanding and predicting a relationship and therefore use it as a framework to study the most critical issues in a parallel business relationship. They highlight the influence of relationship

[53] See Emerson (1976), p. 347-348.
[54] Emerson (1976), p. 348.
[55] See Cropanzano and Mitchell (2016), p. 875.
[56] Emerson (1976), p. 351.
[57] See Cropanzano and Mitchell (2016), p. 882; as well as Wu et al. (2014), p. 123.
[58] Wu et al. (2014), p. 124.
[59] See Wu et al. (2014), p. 124.
[60] See Aminoff and Tanskanen (2013), p. 166 ; as well as Tanskanen (2015), p. 578.

satisfaction on commitment and show trust precedes commitment. In addition Shiu, Jiang, and Zaefarian (2014) mention trust as well as commitment are two pivotal variables of SET since reciprocity, which is the basis for recurring successful exchanges of benefits between individuals, is important in building inter-organizational relationships, however not always assured by formal agreements. They show that lower levels of trust will reduce the level of behavioural commitment which means organizations do not invest as much as they can in the relationships with their partners. Consequently this will reciprocate in a decreased willingness of their partners to invest in the same inter-organizational relationship. So, trust and commitment are related to each other as well as that they are related to reciprocity and thus the stability of inter-organizational relationship.[61]

So this research uses the four variables defined by Wu et al. (2014): trust, commitment, reciprocity, and power[62], to define antecedents for early supplier involvement and information sharing. In addition, shared norms are taken into account, whereas all parties of a relationship have to obey the rules and norms which form the guidelines of the exchange, to achieve a social exchange relationship.

2.2.2 Eliminating opportunistic behaviour in order to establish trust and commitment

Trust is at the heart of every exchange relationship. Generally trust is defined as "(…) a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another"[63] For a supplier to trust a buyer it should thus be willing to accept some extent of vulnerability caused by the chance a buyer will not meet these expectations. In information sharing across supply chain partners trust means the receiving party of the information exchange is willing to rely on that information to make decisions even though it might have been manipulated. Thereby the receiving party accepts some potentially significant financial vulnerabilities. In case an organization is regarded as trustworthy or reliable in information sharing, it is perceived by receiving parties that the giving party in the exchange does not manipulate the information to its own benefits.[64] Manipulating such information is seen as opportunistic behaviour, which is, based on the research of G. T. Gundlach, R. S. Achrol, and

[61] See Shiu et al. (2014), p. 889
[62] See Wu et al. (2014), p. 124.
[63] Rousseau, Sitkin, Burt, and Camerer (1998), p. 395.
[64] See Özer and Zheng (2017), p. 290.

J. T. Mentzer (1995), defined as: "self-centred actions taken against the business interests of the partner and they negatively influence the development of trust as they damage the partner's long-term commitment to the relationship"[65]. If both parties believe the other will not behave opportunistically and thus, a relationship characterized by trust is established, this enables positive expectations towards each other, just as a willingness to be vulnerable.[66] Thereby inter-organizational exchanges are supported.[67] Furthermore it creates perceptions of stability, fosters coordination efforts from both parties, and limits performance losses that would occur because of opportunistic behaviour.[68] In addition Wu et al. (2014) conclude that higher levels of trust can result in constant co-operation and communication, and Özer and Zheng (2017) argue trust is especially important within relationships in an information-critical setting.[69] In order to achieve trusting relationship several aspects are important. According to Jeong and Oh (2017) trust often results from good communications, shared values, and high exit barriers.[70] Not only relational aspects influence the degree of trust, also product and market characteristics are important to take into account whereas these can influence the perceived vulnerability entailed by trust. If higher investment costs are required or if there is higher demand volatility, the vulnerability increases reducing trust. Managers should identify these barriers and thereby enabling themselves to reduce or eliminate those barriers.[71]

Just as trust, commitment tends to entail cooperation between relationship partners[72] and is seen as an essential ingredient for successful long-term relationships.[73] It is defined as: "relationship partners' confidence regarding the importance and efforts of maintaining long-term relationship by willingly making short-term sacrifices"[74] A committed partner will thus be willing to cooperate with the other member due to the desire to make this relationship work.[75] The only behavioural aspect of a commitment is referred to as behavioural commitment. This is concerned

[65] Jeong and Oh (2017), p. 127.
[66] See Rousseau et al. (1998), p. 394.
[67] See Poppo, Zhou, and Li (2016), p. 724.
[68] See Poppo et al. (2016), p. 725.
[69] See Özer and Zheng (2017), p. 302.
[70] See Jeong and Oh (2017), p. 116.
[71] See Özer and Zheng (2017), p. 295-298.
[72] See Jeong and Oh (2017), p. 116.
[73] See G. G. Gundlach, R. S. Achrol, and J. T. Mentzer (1995), p. 78; as well as Mentzer et al. (2001), p. 13.
[74] Shahzad, Ali, Takala, Helo, and Zaefarian (2018), p. 137.
[75] See Morgan and Hunt (1994), p. 26; and Mandal and Sarathy (2018), p. 201.

with the actions or investments taken by partners within a relationship that foster the continuation of a relationship. Examples of such actions are information sharing and relationship-specific investments.[76] Increasing behavioural commitment in a buyer-supplier relationship reduces the feeling of vulnerability among the parties of the relationship.[77] If both partners are committed to the relationship this contributes to the outcomes of cooperation, such as the development and commercialization of new products[78] and the creation of new sources of value and growth[79]. Furthermore it has a crucial importance in the achievement of mutual goals in the relationship.[80] The degree partners are committed to a relationship is influenced by the completeness of contracts, degree of trust, the symmetry of information sharing and interdependence, and the alignment of objectives.[81] Furthermore, just as in trust the high exit barriers are important as well.[82] These are thus important aspects to take into account in case a company is willing to increase the other parties' commitment.

2.2.3 Interdependence, justice and their influence on power and reciprocity

Power and reciprocity are SET variables that have a more indirect impact on buyer-supplier relationships as this relationship mainly manifests through commitment and trust. The concept of power is especially relevant in case of asymmetry in power and interdependence whereas this influences the coordination mechanisms in buyer-supplier relationships. A powerful partner is able to exploit control mechanisms, reduce uncertainty and assure fulfilment of their own goals and thereby reduce the interdependence, where the weaker partner generally hosts resource investments in an attempt to increase the interdependence and raise commitment from the other partner.[83] As mentioned before, this research assumes power refers to the relative dependence between the parties involved in a relationship. The power that is gained by one member of the relationship can influence the decisions and behaviour of the other member.[84] By means of either coercive power or reward power the other party is extrinsically motivated to take a specific

[76] See Jokela and Söderman (2017), p. 270.
[77] See Shiu et al. (2014), p. 889-890.
[78] See Mazzola, Bruccoleri, and Perrone (2015), p. 281-282; and Jokela and Söderman (2017), p. 270.
[79] See Brady (2005), p. 372; and Jokela and Söderman (2017), p. 270.
[80] See G. G. Gundlach et al. (1995), p. 78; and Jokela and Söderman (2017), p. 270.
[81] See Shahzad et al. (2018), p. 135.
[82] See Jeong and Oh (2017), p. 116.
[83] See Brito and Miguel (2017), p. 83.
[84] See Wu et al. (2014), p. 126.

action.[85] In coercive power the less dependent partner in the relationship the ability to punish the more dependent partner and reward power means that the less dependent partner has the ability to reward the other partner.[86] Since coercive power is a negative form of feedback it lowers the supplier's sense of autonomy and competence. Reward power shows opposite results whereas this is a positive form of feedback. It promotes a sense of competence and enhances the motivation to show commitment. So, coercive power used by a buyer hampers the commitment of a supplier where the use of reward power mechanisms positively influences supplier's commitment.[87] In this sense power has only an indirect effect on information sharing and early supplier involvement.

For relationships to be able to evolve over time both parties must abide by certain rules. These rules form the guideline for the exchange in the relationship. Of these rules, reciprocity, also known as repayment, is probably the best known.[88] Reciprocity can be defined as a norm or individual orientation: individuals that have a strong exchange orientation are more likely to return a good deed than those low in exchange orientation. Furthermore, it can be defined in the perspective of a folk belief. This type of reciprocity is more or less similar to what is known as "karma": what you give is what you get. And lastly, reciprocity can be seen as a transactional pattern of interdependent exchanges.[89] This last perspective is most common in buyer-supplier relationships whereas this directly addresses the relationship. The term interdependent in this definition is especially relevant whereas without some degree of interdependence a social exchange relationship is not be possible. Interdependence means that outcomes are based on a combination of both parties' efforts. In case of full dependence or independence, in which the outcomes are based solely on the efforts of just one party, no bidirectional transaction and thus no exchange takes place. [90] Wu et al. (2014) found reciprocity facilitates information sharing.[91] Furthermore it is important for organizations to engage or invest in a relationship since reciprocity implies they have the feeling the participants in the relationship offer reciprocal benefits to one another over time. This emphasizes the importance of having common goals in

[85] See Chae and Choi (2017), p. 40-41.
[86] See Brito and Miguel (2017), p. 63.
[87] See Chae and Choi (2017), p. 52.
[88] See Cropanzano and Mitchell (2016), p. 875.
[89] See Cropanzano and Mitchell (2016), p. 876.
[90] See Cropanzano and Mitchell (2016), p. 876.
[91] See Wu et al. (2014), p. 129.

a relationship.[92] Besides having common goals a sense of reciprocity can be developed through enacting justice policies. It is argued that relational attitudes and behaviours are stimulated through perceived justice demonstrated via policies by the more powerful party in the relationship. Furthermore enacting such policies allows the latter party to retain and protect its power.[93] The aforementioned relational behaviours refer to the expected behaviour of one or more parties involved in the exchange relationship, for example solidarity, sharing additional information, or showing a willingness to work for the relationship. [94]

Now the four most important aspects influencing buyer-supplier relationships in general have been defined and explained, we will further expand this framework. By reviewing the body of literature in which SET is used to create an understanding of preferred customer status, its antecedents, and the circular cycle of supplier satisfaction, customer attractiveness and preferred customer status, further insights will be gathered regarding important influential variables on information sharing and early supplier involvement.

2.3 Social exchange theory in preferred customer status literature

2.3.1 Being a preferred customer: previous research and definitions

Generally, managers as well as academics have the assumption that, to successfully sell products, suppliers have to become as attractive as possible to potential buyers. However, in the current economy a counterintuitive inversion of this classical approach occurs more often. Nowadays buyers attempt to obtain the best resources and therefore strive to become a more attractive buyer than the competitors. Several explanations to this phenomenon have been proposed in the preferred customer literature. Whereas firms increasingly move from the traditional in-house manufacturing and developing towards outsourcing and cooperative buyer-supplier relationships as a source of value creating, suppliers become more important. To acquire benefits of supplier relationships, supplier satisfaction and preferred customer status are essential to the buyer.[95] In addition, in the current supply markets the number of suppliers decreases, which results in a greater supply-side competition among customers. Consequently, suppliers are able to select the customers they want to work with instead of the other way

[92] See Wu et al. (2014), p. 126.
[93] See Griffith et al. (2006), p. 87.
[94] See Griffith et al. (2006), p. 88.
[95] See Vos et al. (2016), p. 4613.

around.[96] It is therefore not always possible for every customer to access prime resources. This forces them to generate an advantage over competitors on the supply side and thereby receive a preferential treatment of the supplier.[97]

In the literature, gaining preferred customer status thus is regarded as crucial for buying firms.[98] A buyer with a preferred customer status gains early access to supplier resources.[99] Furthermore it receives a preferential treatment that includes benefits like early access to innovations[100], better prices[101], and delivery in times of scarcity[102].[103] So, it is not only relevant to study preferred customer status for science and theoretical development, but also for practice. Accordingly, the number of publications on this subject have increased over the last decade. Many of these studies address the aforementioned benefits of preferred customer status. Others focus on the drivers for suppliers to give a preferential treatment and which steps a customer can take to enjoy preferential treatment. For example Steinle and Schiele (2008) note the importance of proximity. If the distance between a buyer and supplier is smaller the changes increase that customer will be awarded with a preferred customer status.[104] Furthermore they stress the influence of internal organizational strength and purchasing volume on preferred customer status.[105] Bemelmans et al. (2015) performed a qualitative multiple-case study with construction companies to research the effect of some specific potential antecedents. They showed it is important supplier perceive the relationship management of a customer as mature.[106] Also their paper addresses the importance of the exploration of relational dynamics in order to find out where the relationship can improve.[107] One of these is the buyer's maturity in supplier relationship management. To shortly summarize most of the discussed antecedents the study of Hüttinger et al. (2012) is used. Hüttinger et al. (2012) provide a detailed literature review based on which actions a buying firm can actually take to receive preferential treatment

[96] See Vos et al. (2016), p. 4613.
[97] See Hüttinger et al. (2014), p. 697.
[98] See Hüttinger et al. (2014), p. 697; as well as Bemelmans et al. (2015), p. 179; and Vos et al. (2016), p. 4613..
[99] See Hüttinger et al. (2014), p. 697.
[100] See Schiele et al. (2011), p. 16.
[101] See Schiele et al. (2011), p. 16.
[102] See Baxter (2012), p. 1255.
[103] See Vos (2017), p. 3.
[104] See Steinle and Schiele (2008), p. 11.
[105] See Steinle and Schiele (2008), p. 12.
[106] See Bemelmans et al. (2015), p. 194.
[107] See Bemelmans et al. (2015), p. 195.

from its suppliers over competitors are identified. They identified many different antecedents divided these across five categories: economic value (e.g. high purchase volumes); profitability (e.g. profitability, business opportunities); relational quality (e.g. trust, fairness, commitment); instruments of interaction (e.g. early supplier involvement, schedule sharing); and strategic compatibility (e.g. strategic fit, shared future).[108]

Another topic that is increasingly discussed is the circular relationship between supplier satisfaction, customer attractiveness, and preferred customer status. Recognizing this relationship is important in developing a further understanding how the antecedents influence the determination by suppliers whether a customer gets awarded by a preferred treatment. [109] Until 2012 the three constructs have only been discussed in isolation.[110] They argued that not only preferred customer status determines whether a customer can enjoy preferential treatment. Rather, customer attractiveness as well as supplier satisfaction have an influence on this. From this perspective, customer attractiveness is key for a supplier to participate or intensify a relationship with a buyer. Once a relationship is established the supplier has certain expectations that should be met in order to achieve supplier satisfaction. If a supplier is more satisfied in a relationship with a particular customer than with others, that customer will be awarded preferred customer status and thus receive preferential treatment.[111] In the following chapter a deeper understanding will be presented on the circular relationship between supplier satisfaction, customer attractiveness, and preferred customer status using an SET framework.

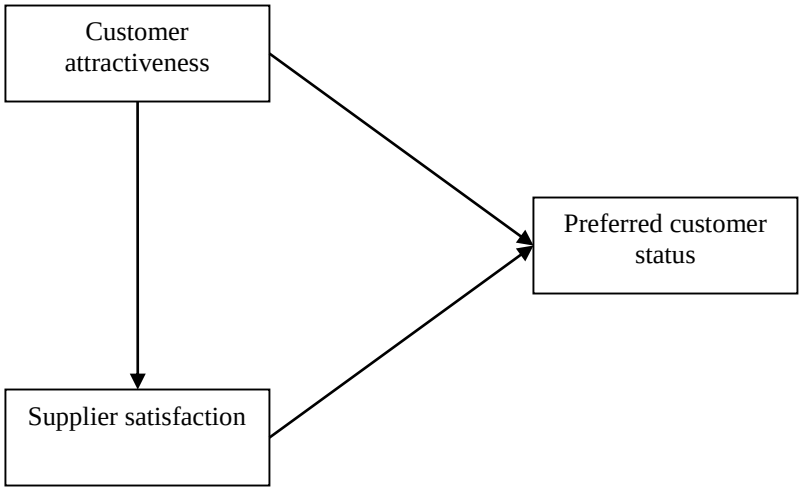
2.3.2 The cycle of the preferred customer status – an SET framework.

Two concepts are argued to play a role in becoming a preferred customer: supplier satisfaction and customer attractiveness. Supplier satisfaction can be defined as "(…) the condition that is achieved if the quality of outcomes from a buyer-supplier relationship meets or exceeds the supplier's expectations"[112] and customer attractiveness explained as follows: "(…) a customer is perceived as attractive by a supplier if the supplier in question has a positive expectation towards the relationship with this customer"[113]. Even though these concepts are related they are,

[108] See Hüttinger et al. (2012), p. 1201.
[109] See Hüttinger et al. (2012), p. 1194; and Hüttinger et al. (2014), p. 698.
[110] See Hüttinger et al. (2012), p. 1194.
[111] See Hüttinger et al. (2012), p. 1194-1195.
[112] Pulles et al. (2016), p. 131; referred to Schiele, Calvi, and Gibbert (2012).
[113] Pulles et al. (2016), p. 131; referred to Schiele et al. (2012).

as their definition implies, conceptually different and require different supply chain management practices.[114] Despite the fact that it makes sense to acknowledge this difference in testing how these constructs relate to each other, as well as how they related to preferred customer status, many studies addressing this circular relationship around preferred customership neglect the difference. One of the studies that did take this difference into account was performed by Pulles et al. (2016). They tested hypotheses based on the circular relationship around preferred customer status (see figure 1) proposed by previous studies.

Figure 1: hypothetic circular relationship by Pulles et al. (2016)

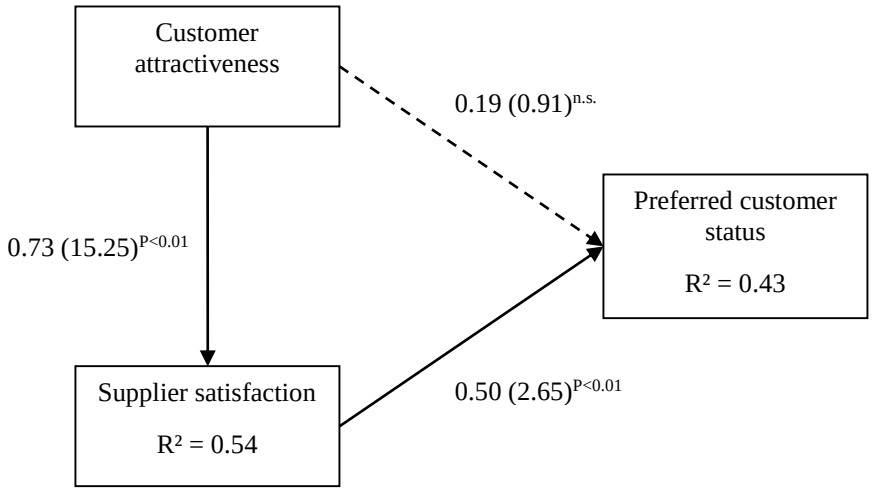


Schiele et al. (2012) and Hüttinger et al. (2014) use three core elements of SET and link these to the cycle of preferred customership in order to establish an understanding of how these concepts potentially relate to each other.[115] The first social exchange element is expectations. Actors will only initiate and continue a relationship that they expect rewards themselves, so expectations determine the initiation of a relationship. Furthermore, Wilkinson, Freytag, and Young (2005) and Hüttinger et al. (2014) argue suppliers will only invest in a relationship with a customer if that supplier is perceived attractive.[116] Following Schiele et al. (2012) customer attractiveness thus might be a condition for preferred customership.[117] The second element is the comparison level. Herein the exchange is judged against the expectations of the supplier

[114] See Pulles et al. (2016), p. 129.
[115] See Schiele et al. (2012), p. 1183.
[116] See Wilkinson et al. (2005), p. 678; and Hüttinger et al. (2014), p. 698.
[117] See Schiele et al. (2012), p. 1184.

which were determined in the former element. According to the definition of supplier satisfaction, if the relationship outcomes meet or exceed these expectation supplier satisfaction will be achieved. According to Baxter (2012), the more satisfied a supplier is with a customer, the more likely it is that this customer enjoys preferential treatment.[118] The final element is the comparison level of alternatives, this includes relative criteria that complement the expectations against which the outcomes of the relationship are judged.[119] The relative criteria are for example the experiences with other customers. Comparing different relationships will eventually result in the decision which customer gets awarded a preferential status. So, a supplier gives a customer preferential treatment if this customer offers better results than competitors.[120] Based on these arguments the following hypotheses were tested: (1) customer attractiveness is positively related to preferential treatment; (2) supplier satisfaction is positively related to preferential treatment; and (3) the relationship between customer attractiveness and preferential treatment is mediated by supplier satisfaction.[121] By means of a partial least squares analyses they found evidence all hypotheses. However, customer attractiveness only significantly relates to preferential treatment if supplier satisfaction is left out the analysis. Their final results are represented in Figure 2.

Figure 2: Statistics circular relationship by Pulles, Schiele, veldman, and Hüttinger (2016)



[118] See Baxter (2012), p. 1255.
[119] See Schiele et al. (2012), p. 1186-1187.
[120] See Schiele et al. (2012), p. 1186-1187; and Hüttinger et al. (2014), p. 698.
[121] See (Pulles et al., 2016), p. 131-132.

Whereas the R^2 has still potential to increase more variables and measurements can be included. In order to decide on which variables to include, previous research on measuring supplier satisfaction and customer attractiveness are shortly discussed in the following chapter. This chapter is concluded with a model including measurement variables ought relevant in theory.

2.3.3 Explaining measurement constructs of the preferred customership, supplier satisfaction and customer attractiveness

In 2012 the circular relationship around preferred customership was firstly addressed by two separate studies. First, Schiele et al. (2012) established a conceptual framework in which they suggested preferred customership is determined by supplier satisfaction and preferred customership. [122] Second, Baxter (2012) was able to empirically test a model including some of these construct. They measured the relationships between customer financial attractiveness, supplier satisfaction, supplier commitment and preferred customer treatment and showed customer financial attractiveness is related to supplier commitment, supplier satisfaction, and preferred customer treated. In addition, their test proved that the relationship between supplier satisfaction and preferred customer treatment is fully mediated by supplier commitment. Two years later Hüttinger et al. (2014) explored the factors that induce suppliers to treat customers more preferentially than others. They suggested customer attractiveness, supplier satisfaction and preferred customer determine preferential treatment. By means of quantitative research they were able to show that growth opportunity, operative excellence and relational behaviour have significant impact on customer attractiveness. Furthermore, growth opportunity and relational behaviour, complemented with reliability, payment habit, and communication have a positive influence on supplier satisfaction. [123]

In 2016, again, the impact of customer attractiveness and supplier satisfaction on becoming a preferred customer was investigated by Pulles et al. (2016). They were the first to empirically test the circular relationship around preferred customership using comprehensive measures of the relevant dimensions of these constructs. In their study they amplified the difference in antecedents and dimensions of the supplier satisfaction and customer attractiveness and thereby aimed to develop a comprehensive overview of construct dimensions to develop a measurement

[122] See Schiele et al. (2012), p. 1179.
[123] See Hüttinger et al. (2012), p. 1200.

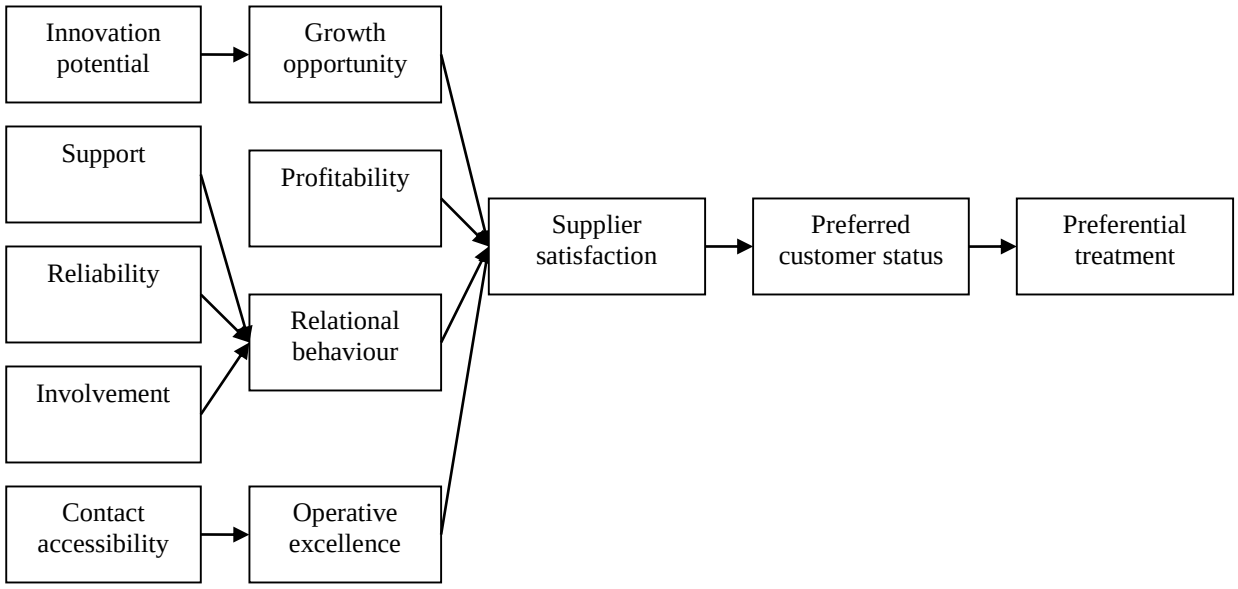
instrument for both concepts. Preferred resource allocation was used as a measurement for achieving preferred customer status. For measuring supplier satisfaction they used the satisfaction with the obtained value of the relationship and satisfaction with the relationship in general as measurement constructs. To measure customer attractiveness, the variables 'willingness to intensify the relationship' and 'future expectations of attractiveness' were used. They concluded supplier satisfaction has a dominant influence on receiving a preferential treatment, however, this does not imply customer attractiveness is not relevant. Customer attractiveness is important to the initiation of business relationships as well as for the intensification of the relationship. Furthermore it provides an indication for commitment of suppliers.[124]

Besides measurement variables, also antecedents that relate to supplier satisfaction and perceived customer attractiveness have been identified in the literature. As mentioned before Hüttinger et al. (2014) already addressed some of these. Based on the literature review by Hüttinger et al. (2012) they identified future business opportunities, share of sales, potential for value creation as well as some relational factors such as loyalty, commitment, and trust as antecedents for perceived customer attractiveness. Even though these antecedents were recognized in their literature review they were not included in the statistical analysis of their research. For both the supplier satisfaction and customer attractiveness they included the following antecedents: growth opportunity (i.e. growth, volume, brand name, and image), innovation potential (i.e. expertise, innovation orientation, and innovation possibilities), operative excellence (i.e. planning, decision making, and processes), reliability (i.e. opportunism, contract compliance, and adherence to agreements), support (i.e. training, supplier development, advice), involvement (early and close involvement in NPD), access to contacts (cross-functional contact person), and relational behaviour (i.e. solidarity, mutuality, and flexibility).[125] By replicating this study in 2016, using new statistical PLS technologies and adding an unexplored new antecedent to this model, Vos et al. (2016) were able to identify perceived profitability as an extra antecedent to supplier satisfaction. In addition they concluded with a model in which operative excellence, relational behaviour, profitability and growth

[124] See Pulles et al. (2016), p. 131-139.
[125] See Hüttinger et al. (2014), p. 702.

opportunity have a significant direct effect on supplier satisfaction and serve as mitigating variables for innovation potential, support, reliability, involvement and contact accessibility.[126] Based on this the following hypothetical model can be created.

Figure 3: Theoretical model cycle - preferred customership cycle with antecedents based on Hüttinger, Schiele, and Veldman (2012) and Vos, Schiele, and Hüttinger (2016).



To add to the current literature on this topic and expand the model the roles of information sharing and early supplier involvement will be taken into account. The following section focusses on the definitions, antecedents, measurements and outcomes of early supplier involvement and information sharing.

3 Early supplier involvement and information sharing

3.1 Efficient new product introduction processes as a means to achieve competitive advantage

3.1.1 Conceptualization and benefits of efficient new product introduction (NPI)

Rapid and radical technological developments, globalization of business, continuing mergers, greater emphasis on ethical dimensions and sustainability, and decrease of vertical integration

[126] See Vos et al. (2016), p. 4620.

resulting in increased outsourcing all dynamically changed our business environment in the past decades. Where companies once competed successfully by developing 'hit' products, without focussing on minimizing development times and engineering costs, these companies may now find themselves unable to effectively compete with firms that have focussed in improving their product introduction processes.[127] So, efficient and effective new product introductions are vital to most manufacturing firms' sustainability and growth in todays' competitive environment. It is therefore important for a firm to make sure their product introduction processes adhere to development schedules and costs, as well as that the developed products meet the expectations regarding product quality and costs.[128] According to Ernst (2002) factors that contribute to such an efficient and effective process are for example a clearly defined NPI process, a culture and strategy that support innovation and creativity, and a supportive role of senior management.

A NPI process exists of different phases. These phases can be either sequential, a go/no go decision is made before proceeding to the next step, or overlapping, where the steps are iterative.[129] Even though there is no 'best' order of steps described in the literature, Schiele (2010) was able to identify four generally used phases in new product introduction processes. Based on a consortial benchmarking study with six case companies the following phases are defined: the concept phase, the design phase, the piloting phase, and the transition to an operations phase.[130] In the concept phase a concept is designed after which a decision is made to continue with the actual development of the product or not. If so, the design phase follows which is concluded with an approved design. During the piloting phase the design is tested. Once the product passes the tests it enters the transition to an operations phase. The last phase also includes production release. Another way to describe the phases in NPI was proposed by Petersen et al. (2005), they defined the following phases[131]: (1) idea generation; (2) business/technical assessment; (3) product concept development; (4) product engineering and design; (5) prototype build, test and pilot. Two steps were added before the actual concept development stage, and the transition to operations phase was left out. In the latter dividing of

[127] See Nobeoka and Cusumano (1997), p. 169.
[128] See Hoegl and Wagner (2016), p. 530.
[129] See Petersen et al. (2005), p. 377.
[130] See Schiele (2010), p. 147.
[131] See Petersen et al. (2005), p. 377.

phases there is a focus the actual development of a product, where Schiele (2010) also focus on the introduction of the new product.

In general it is a new product introduction team that goes through these phases. Employees from different departments with different functions across the organization can be a member of an NPI team whereas it is an activity that demands high levels of intra-functional interactions.[132] This type of interaction happens for improved discussions on technical aspects. A more tactical type of interaction to consider short-term plans that influence different departments is inter-functional interaction, which is common at a middle-management level. In this a middle-manager does not necessarily have to be a member of the responsible team. Where these were all examples of internal integration, external integration across the supply chain is gaining increasing attention as well.[133] A form of supply chain integration is the involvement of suppliers in new product introduction processes.[134] This is one of the focal points of this research. According to (Petersen et al., 2005) new product development introduction project success even depends on a firm's ability to integrate its suppliers in the process. They mention NPI project success is a "(…) function of an effective supplier selection process, supplier involvement in establishing business performance metrics and targets for the project, and supplier involvement in establishing technical performance metrics and targets for the project."[135] It is important to note that early supplier involvement does not only have bright sides. It involves significant risk, time, and financial resources for both parties which cannot be taken lightly. Therefore organizations should be aware of which factors contribute to success and which to failure of early supplier involvement efforts. The remainder of this chapter further introduces early supplier involvement and addresses the most influential factors derived from the literature.

3.1.2 Involving suppliers in NPI for smoother and more cost-efficient processes

By means of early supplier involvement key or strategic suppliers' competences are integrated in the supply chain or operations of the buyers.[136] In addition, it also allows for early problem

[132] See Felekoglu, Maier, and Moultrie (2013), p. 386.
[133] See Ataseven and Nair (2017), p. 252.
[134] See Takeishi (2001), p. 405.
[135] Petersen et al. (2005), p. 373.
[136] See Dobler and Burt (1996), p. 30; as well as Dowlatshahi (1999), p. 4119; and Wynstra et al. (2001), p. 158.

detection, provides a buying firm with a possible route for outsourcing, and it can improve communication and information sharing between the buyer and supplier.[137] ESI, when implemented successfully, thus can result in several beneficial outcomes. Early supplier involvement is commonly defined as "(…) the extent to which a buyer organization shares responsibility with a supplier organization for the development of design of the subsystem (component) of a new product."[138] According to this definition different levels of responsibility exist when considering early supplier involvement. In some cases in-house designers work closely with suppliers to assure a certain degree of quality in some components (gray-box integration), and in other cases design of sub-assemblies is fully outsourced to suppliers (black-box integration). [139] This example suggests that the level of responsibility, at least partially, depends on the type of involvement. Another dimension that has to be considered in analysing how a firm involves its supplier is the timing of involvement.[140]

According to Bonaccorsi (1994) the moment of supplier involvement is the phase at which the customer starts the search for suitable suppliers and make them aware of the project.[141] Ronan McIvor et al. (2006) propose this can be during the concept phase, detail engineering phase, or the process engineering phase.[142] Involvement during the concept phase enables suppliers of body components to provide manufacturing advice to model stylists. In the detail engineering stage large component system suppliers can take responsibility for proprietary parts. For involvement of suppliers in the last phase, the process engineering phase, manufacturing knowledge is required, so herein raw material suppliers or equipment manufacturers play an important role. The moment of involvement of a supplier depends on the form of supplier involvement. As mentioned before, two popular forms of supplier involvement in new product introduction are black-box and gray-box integration.[143] Within black-box integration suppliers work on their own to fulfil the manufacturer's specifications. In this situation both parties, the buyer and supplier, are each responsible for their own tasks and products. Since there is

[137] See R.. McIvor and Humphreys (2004), p. 180.
[138] Hoegl and Wagner (2016), p. 531; based on Takeishi (2001), p. 409.
[139] See Ronan McIvor, Humphreys, and Cadden (2006), p. 376.
[140] See Bonaccorsi (1994), p. 135.
[141] See Bonaccorsi (1994), p. 135
[142] See Ronan McIvor et al. (2006), p. 376.
[143] See Koufteros, Cheng, and Lai (2007), p. 848.

infrequent communication and little interference it is important both parties trust each other.[144] In the gray-box integration, suppliers work closely with the manufacturer to jointly develop new products and make decisions. [145] A supplier can provide expertise, suggestions or other input for the development of a product, but will not bear sole responsibility for the development of subcomponents, modules, or the final product.[146]

Regardless of the type of supplier involvement, involvement includes risk and financial resources from both parties. It therefore calls for bilateral commitment to engage in frequent communication for the exchange of relevant information for decision making and sharing technological skills and knowledge.[147] Whereas it is uncommon, or even impossible, for relationships to just be there[148], they have to take time to establish a stable relationship and develop integrated process[149]. Besides commitment, trust is important as well since it encourages partners to share sensitive information that is relevant for the development of a new product.[150] Unfortunately, it is not present in every exchange situation. In these cases firms typically resort to one or more forms of formal governance mechanisms like contracts, relational norms, and coercive power to safeguard their interests and limit opportunistic behaviour.[151] More in-depth factors influencing supplier involvement directly, or indirectly by increasing trust and commitment will be discussed in the following chapter.

3.1.3 Operational factors that influence successful implementation of supplier involvement in new product introduction

Successful early supplier involvement starts with selecting the right suppliers. However, a key challenge to organizations remains to get in the right suppliers, at the right time, and get them to contribute to the new product development process.[152] Most organizations expect a supplier that is involved in such a process also produces at least a portion of the volume production.[153] Therefore a supplier is not only selected on how their technological and cultural/behavioural

[144] See Koufteros et al. (2007), p. 849.
[145] See Koufteros et al. (2007), p. 848.
[146] See Chang (2017), p. 130.
[147] See Chang (2017), p. 131.
[148] See Shiu et al. (2014), p. 890.
[149] See Parker et al. (2008), p. 74-75.
[150] See Parker et al. (2008), p. 74.
[151] See Liu, Li, and Zhang (2010), p. 3; as well as Kam and Lai (2018), p. 240.
[152] See Petersen et al. (2005), p. 372.
[153] See Petersen et al. (2005), p. 375.

capabilities align with the requirements of the buyer, criteria regarding their products like costs, quality, and delivery time are also considered.[154] This emphasizes the dual role of purchasing in which suppliers are now not selected solely based on product characteristics, but also on innovation capabilities or collaborative fit.[155] In addition, whereas in situations such as NPI firms generally rely upon suppliers that are specialized in specific technologies used for the production of the sub-system it delivers[156], supplier selection depends on technology selection and its criticality to the product as well. Following these additional difficulties in supplier selection, Emden, Calantone, and Droge (2006) proposed a three-phase model managers can follow for successful co-development projects. These phases are: technological alignment, strategic alignment, and relational alignment.[157] Within technological alignment the technological ability, resource complementarity and overlapping knowledge bases of the supplier are considered. The buyer aims to develop a mutual understanding of technologies as well as their implications in the market with the potential supplier. Strategic alignment refers to motivation and goal correspondence. Herein a team is established that sets out the initial co-development project specifications. And finally, relational alignment concerns compatible cultures, the propensity to adapt, and long-term orientation. The financial and legal feasibility of co-development are determined and an organizational acceptance is created.[158] By following these steps a partner is chosen with the potential to create overall synergistic value.

As a result of the strategic alignment phase a mutual understanding of the goals and aimed outcomes of the relationship thus is established. This is important to make a decision on which governance mechanism is crucial for that situation.[159] Whereas building a trusting, committed relationships takes time[160], and trust is not present in every exchange situation, in these cases firms typically resort to one or more forms of formal governance mechanisms to limit opportunistic behaviour.[161] For the purpose of this research the governance mechanisms are divided into two categories: social governance mechanisms and economic governance

[154] See Petersen et al. (2005), p. 375.
[155] See Schiele (2010), p. 140; and Hoegl and Wagner (2016), p. 543.
[156] See Melander and Tell (2014), p. 105.
[157] See Emden et al. (2006), p. 334.
[158] See Emden et al. (2006), p. 336 and 340; as well as Melander and Tell (2014), p. 106.
[159] See Shahzad et al. (2018), p. 136.
[160] See Cropanzano and Mitchell (2016), p. 875.
[161] See Liu et al. (2010), p. 3; as well as Kam and Lai (2018), p. 240.

mechanisms. Economic governance mechanisms are "(…) rational organizational measures, which support managing, monitoring and harmonizing partners' behaviours in relationship exchange".[162] Examples of economic governance mechanism is the use of contracts and symmetric dependence. The use of contracts in early supplier involvement is essential because of several reasons. First, in NPD a suppliers often has to make significant investments that do not immediately improve its own profits.[163] Therefore they will be more hesitant to engage in such a relationship. By means of a contract in which a buyer promises the supplier a proportion of the production if it can meet the target costs, this can be overcome.[164] In addition the contracts serve as some kind of insurance the customer fulfils its promises, whereas a supplier might not be able to recover from the significant investment it made otherwise. [165] Second, in new product introduction it is important both parties understand the objectives and goals of the project as well as that they know each other's responsibilities. A contract can serve as a framework to capture these details. If these details are not sufficiently and clearly enough included in the contract this can have a negative influence on transaction costs and relationship commitment.[166]

Social governance mechanisms are defined as "(…) socially embedded organizational measures in economic activities, which help in managing, monitoring and organizing relationship exchange".[167] These are for example trust and communication. By means of communication information can be shared within and across organizations. Inter-organizational communication is conceptualized as a relational competency; it mediates between several antecedents and outcomes of a relation for the buyer and supplier.[168] Mandal and Sarathy (2018) argue communication between network partners builds trust, and so, commitment, which results in a stable relationships.[169] So communication and thereby information sharing are seen as important factors in early supplier involvement as well as in creating a stable relationship. In the following chapter we will further elaborate on information sharing and communication.

[162] Shahzad et al. (2018), p. 136.
[163] See Chiang and Wu (2016), p. 249.
[164] See LaBahn and Krapfle (2000), p. 175.
[165] See LaBahn and Krapfle (2000), p. 178.
[166] See Shahzad et al. (2018) , p. 135.
[167] Shahzad et al. (2018), p. 136.
[168] See Carr and Kaynak (2007), p. 46.
[169] See Mandal and Sarathy (2018), p. 202.

3.2 Information sharing as important mitigating variable

3.2.1 Information sharing: definitions, characteristics, and benefits

As mentioned before, in the current industry managing buyer-supplier relationships is increasingly used as a source of value creation. However, it still occurs that due to the inability or unwillingness to leverage information flows between the partners the maximum potential value will not be gained.[170] This emphasizes the importance of information sharing in buyer-supplier relationships. Further underlining this relevance, Huang et al. (2003) acknowledge the debate is not about whether to share information or not, but about how to share the right information at the right time, in the right format, by the right people.[171] Before moving on to the what, when, and how aspects of information sharing, first an understanding of the concept has to be established. Therefore the definition from the study of Carr and Kaynak (2007) will be adopted. They combined aspects from several other studies and concluded the following: "information sharing between the firms refers to information shared between a buyer and key suppliers that is detailed enough, frequent enough, and timely enough to meet a firm's requirements."[172]

Different benefits can be achieved through information sharing. Which benefits depend on what kind of information is shared. If for example selection criteria of potential suppliers is clearly communicated this gives these potential suppliers a clear understanding of what the customer expects from them. [173] In return the supplier is able to share relevant information on their technical and relational outcomes. [174] Whereas the goal of early supplier involvement in new product development is to integrate key or strategic suppliers' competences in the operations of the buyer[175] and thereby create several beneficial outcomes for the buyer, every party involved needs to understand and agree upon the expected benefits in terms of costs, quality, scheduling, roles, and responsibilities associated with the supplier integration effort.[176] Having equal knowledge of the outcomes and objectives of the project allows for early problem detection, and

[170] See Hsu et al. (2008), p. 296-297.
[171] See Huang et al. (2003), p. 1484.
[172] Carr and Kaynak (2007), p. 349.
[173] See Vonderembse and Tracey (1999), p. 33.
[174] See Petersen et al. (2005), p. 375.
[175] See Dobler and Burt (1996), p. 30; as well as Dowlatshahi (1999), p. 4119; and Wynstra et al. (2001), p. 158.
[176] See Petersen et al. (2005), p. 376.
[176] See Petersen et al. (2005), p. 376.

provides a firm with a possible route for outsourcing.[177] In order to achieve this the discovery and absorption of tacit, technology specific, knowledge is essential.[178]

After the product has been developed and entered the production phase information sharing remains important. Different types of information can be shared during production. Huang et al. (2003) performed a literature review on information that is shared during a buyer-supplier relationship and identified six information categories: product, process, resource, inventory, order, and planning.[179] Product information is the information addressing production characteristics and structure, also known as the bill-of-materials, of the products produced in the supply chain. Process information describes the business process in the supply chain like ordering, production and shipment. Relevant process information is for example lead-time, the costs of the process and the process control policies. Resource information consists of two aspects: capability and capacity. Capability addresses the number and type of products a supplier can produce and capacity is about its ability to meet future demand. Order information can regard sending your own orders to direct suppliers, but also sharing orders of the end customers across the whole supply chain. The last type of sharing reduces the bullwhip effect since it prevents double demand forecasts. Inventory information includes information about on-hand inventory, back-log and WIP such as the inventory level, unit costs and control policy. Being aware of the inventory levels of other partners across the supply chain can help to reduce the overall inventory. And lastly, planning information includes demand forecasts and order schedules.

To be able to achieve the benefits mentioned before, one has to be aware of the variables that determine to some extent the failure or success of information sharing. The most commonly mentioned variables will be set out in the following chapter.

3.2.2 Operational failure and success factors of information sharing

It appears organizations have a built-in reluctance to share information since it is perceived information disclosure can result in loss of power. Furthermore organization might feel this information can potentially be leaked to rivals. It is therefore key to facilitating quality in

[177] See R.. McIvor and Humphreys (2004), p. 180.
[178] See Petersen et al. (2005), p. 376.
[179] See Huang et al. (2003), p. 1492-1499.

information sharing between supply chain partners to understand the variables that affect these barriers.[180] Whereas, regardless of the type of information, some form of inter-organizational communication is required. Different methods for communication exist; communication can take place via traditional communication methods like face-to-face meetings, e-mail contact, and through conversations over the phone, or via more advanced communication methods like enterprise resource planning (ERP) or electronic data interchange (EDI).[181] It is regarded as important by several studies to have the right information systems in place and integrate these across the supply chain. [182] If that is the case, information technologies have the opportunity to increase the volume and complexity of information that can be shared between partners.[183] This is especially important for sharing strategic information whereas frequent and intense communication between firms is required. [184] Even though technology is important, firms need to understand that establishing a flow of information between firms by means of technology is insufficient to fully leverage a bi-directional information exchange.[185] By means of face-to-face commitments, communication can be improved and thereby it increases trust and the level of information sharing.[186] Furthermore, a recent study of Özer and Zheng (2017) showed it is important to have a structured decision making process to enhance information sharing whereas this encourages team members to share and assimilate divergent information before making the final decision.[187] Besides, it is important for firms to share strategic information as well in addition to the already shared transactional data like product orders and materials.[188] And partners in information sharing should trust the other in that they will not act opportunistically. They should believe the other will not take self-centred actions against the business interests of the partner, such as sharing confident information with competitors of the other.[189] Only if partners are willing to share confident information this trust can be established. [190] Besides, just

[180] See Li and Lin (2006), p. 1642.
[181] See Carr and Kaynak (2007), p. 349.
[182] See Surati and Shah (2014), p. 1758-1761
[183] See Prajogo and Olhager (2012), p. 515-516.
[184] See Li and Lin (2006), p. ; Prajogo and Olhager (2012), p. 516.
[185] See Hsu et al. (2008), p. 306.
[186] See Fawcett et al. (2007), p. 359.
[187] See Özer and Zheng (2017), p. 306.
[188] See Li and Lin (2006), p. ; Prajogo and Olhager (2012), p. 516.
[189] Jeong and Oh (2017), p. 127.
[190] See Fawcett et al. (2007), p. 359.

as mentioned before, having shared values, good communication, and high exit barriers often help to build trust in a relationship.[191]

To go further into depth in the other aspects, a model developed by Paulraj et al. (2008) will be discussed. They identified key antecedents and outcomes of inter-organizational communication within collaborative buyer-supplier relationships and concluded long-term relationship orientation, network governance, and information technology foster inter-organizational communication.[192] A long-term orientation enables communication and the exchange of information and knowledge. One of the aspects of a long-term orientation is the ongoing collaborative interaction between partners that results in relational competencies. These create a strategic advantage in the market and cannot easily be replaced. Therefore, if partners have a long-term orientation the exit barriers will increase which enhances trust, commitment and thereby information sharing.[193] Network governance facilitates the development and maintenance of value-enhancing relational exchanges. [194] According to SET value-enhancing exchanges increase the quality of the collaborative relationship and, as already mentioned, this will eventually result in a relationship characterized by trust and commitment, which are antecedents to information sharing.[195] Surati and Shah (2014) add to this by stating a collaborative relationship has to be created in which partners trust each other and the power is balanced.[196] Furthermore, both studies agree it is important to have the right information systems in place and integrate these across the supply chain. [197] Information technologies increase the volume and complexity of information that can be shared between partners.[198] This is especially important for sharing strategic information whereas frequent and intense communication between firms is required. [199]

[191] See Jeong and Oh (2017), p. 116.
[192] See Paulraj et al. (2008), p. 57.
[193] See Paulraj et al. (2008), p. 48; as well as Jeong and Oh (2017), p. 116; and Shahzad et al. (2018), p. 135.
[194] See Paulraj et al. (2008), p. 48-49.
[195] See Wu et al. (2014), p. 129.
[196] See Surati and Shah (2014), p. 1758-1761
[197] See Surati and Shah (2014), p. 1758-1761
[198] See Prajogo and Olhager (2012), p. 515-516.
[199] See Li and Lin (2006), p. 1646-1647 ; Prajogo and Olhager (2012), p. 516.

3.2.3 Previous research on measuring information sharing

Based on literature on information sharing different variables to measure the level and success of information sharing can be identified. According Li and Lin (2006); Marinagi, Trivellas, and Reklitis (2015); Prajogo and Olhager (2012); Zhou and Bentonjr (2007) one of the success factors of information sharing is information quality. Information quality is achieved when the information exchanged between supply chain partners meets the needs of these organizations.[200] In the Information Quality Guidelines provided by the United States Patent and Trademark Office USPTO (2014) information quality is defined as "(…) an encompassing term comprising objectivity, utility and integrity"[201]. Each of these aspects of quality addresses some of the possible measurement variables. Objectivity involves two elements: presentation and substance. This means that the content of the information, but also the presentation of the information should be clear, accurate, complete, and unbiased. Utility refers to the usefulness of information, and integrity means the security of information.[202] Not in every study in which information quality is measured these variables are adopted. Li and Lin (2006) measure quality of information by means of timeliness, accuracy, completeness, adequateness, and reliability. Furthermore they used another construct to measure information sharing using the following variables: "(…) we inform trading partners in advance of changing needs"; "(…) our trading partners share proprietary information with us"; and "(…) our trading partners share business knowledge of core business processes with us".[203] Other construct measures are proposed by Zhou and Bentonjr (2007) who study the integration between information sharing and supply chain practice in supply chain management. They used nine different measurement variables: accuracy; availability; timeliness; internal connectivity; external connectivity; completeness; relevance; accessibility; and frequently updated information.[204]

Prajogo and Olhager (2012) mention that next to the quality of information sharing the quantity and frequency of information sharing are of relevant importance as well. According to their research, frequent and intense communication is required for firms to share strategic information

[200] See Zhou and Bentonjr (2007), p. 1350-1351.
[201] USPTO (2014)
[202] See Marinagi et al. (2015), p. 474-475.
[203] Li and Lin (2006), p. 1654.
[204] See Zhou and Bentonjr (2007), p. 1351.

in addition to transactional information.[205] With the purpose of assuring measurement construct validity they used measurements used in the research of Chen and Paulraj (2004) who in their research analysed and refined different reliable and valid measurements that can be used in different contexts to test theory within the area of supply chain management. Those regarding frequency are: "(…) exchange of information takes place frequently, informally and/or in a timely manner"; and "(…) we have frequent face-to-face planning/communication".[206] In addition the research of Villena, Revilla, and Choi (2011) on the dark side of buyer-supplier relationships touches upon information sharing as well. Both structural and relational social capital theory are taken into account in this paper. Structural social capital addresses the patterns and connections between parties. So, it is about the structure of ties and interactions via which information is shared. The relational social capital theory focusses on the personal relationships between parties that are the result of a history of interactions, like information sharing.[207] In their research they suggest the value of social capital might begin to decay whereas risks and costs eventually increase while the rate of benefits stagnates.[208] In line with this, they propose that the quantity of information shared is too large which makes it hard for organizations to process it, and select the most important information. To measure the quantity of information sharing they measured the extent to which both parties: frequently communicate with each other; frequently communicate at different levels; frequently communicate between different functions; have a close personal interaction between the parties; have a personal friendship between the parties; have common project reviews; and use internal linking systems.[209]

Lastly, Zhou and Bentonjr (2007) and Prajogo and Olhager (2012) mentioned information sharing technology is one of the relevant constructs as well.[210] Carr and Kaynak (2007) refer to this as communication methods and mention these technologies enable information sharing.[211] Information sharing technologies can, as mentioned before, be divided into traditional methods like face-to-face meetings, e-mail contact, and through conversations over the phone, or in more advanced methods like enterprise resource planning (ERP) or electronic data interchange

[205] See Li and Lin (2006), p. 1654; and Prajogo and Olhager (2012), p. 516.
[206] Chen and Paulraj (2004), p. 414.
[207] See Villena et al. (2011), p. 562-563.
[208] See Villena et al. (2011), p. 562.
[209] See Villena et al. (2011), p. 573.
[210] See Zhou and Bentonjr (2007), p. 1351; as well as Prajogo and Olhager (2012), p. 516.
[211] See Carr and Kaynak (2007), p. 349.

(EDI).[212] According to Wognum, Fisscher, and Weenink (2002) technologies cannot replace face-to-face communication, rather, they provide additional opportunities for sharing information.[213] Carr and Kaynak (2007) found that while advanced communication methods can be helpful, they are not critical with respect to influencing information sharing between firms, where traditional communication methods do significantly influence information sharing between firms according to their study.[214] Even though this study did not show significance of advanced communication methods it might be that due to later developments of the industries as well as technologies these have a significant impact on information sharing nowadays. Therefore these technologies are included as variables in studying information sharing as well.

4 Hypotheses and initial analysis

4.1 Initial analysis of the gap between literature and the procedures at the case company.

An initial analysis of how business is done at this moment at the case company is important to be able to identify relevant actions for improving information sharing and early supplier involvement. According to our literature review enhancing these concepts can be achieved via establishing relationships with suppliers should be characterized by trust, commitment, interdependence, and reciprocity. [215] By means of frequent communication and symmetry of information sharing, relationship specific investments, completeness of contracts, high exit barriers, common goals, justice policies, future business opportunities, and a fair use of power in the form of rewards, an organization can improve a buyer-supplier relationship. As mentioned in the review, for early supplier involvement especially sharing sensitive information, resource allocation from both parties, understanding each other's capabilities and expertise, effective supplier selection, and the use of the right governance mechanisms are important.[216] For information sharing having an integrated IT environment, face-to-face commitments, network governance, and both having a long-term orientation are relevant aspects to focus on. [217] In

[212] See Carr and Kaynak (2007), p. 349.
[213] See Wognum et al. (2002), p. 347.
[214] See Carr and Kaynak (2007), p. 364.
[215] See Wu et al. (2014), p. 123; as well as Cropanzano and Mitchell (2016), p. 882.
[216] See Petersen et al. (2005), p. 372; as well as See Parker et al. (2008), p. 74-75; Jeong and Oh (2017), p. 116; Rajkumar and Stentoft (2017), p. 195; and Kam and Lai (2018), p. 240.
[217] See Huang et al. (2003), p. 1492-1499; as well as R.. McIvor and Humphreys (2004), p. 180; Fawcett et al. (2007), p. 359; Paulraj et al. (2008), p. 57; Surati and Shah (2014), p. 1758-1761; and Jeong and Oh (2017), p. 116.

addition this research assumes that by achieving a preferred customer status information sharing and early supplier involvement are improved.

In Appendix D a rough overview of the current procedures relevant to the purchasers of the case company is displayed. Each of the steps covers one or more procedure(s). For example, within the phase of supplier selection, fourteen different procedures are documented, of which one is called supplier selection as well. Herein, eight steps have to be followed to be able to select and approve a supplier. As the case company produces products on behalf of its customers, the customer is involved from the early beginning. In this first phase the key attributes and technologies are defined. Hereafter, potential suppliers are selected, assessed and audited, and based on the outcomes a supplier is selected. Suppliers only have potential if they can meet the key attributes defined with the customer. If one would strictly follow these documented procedures, the only information that is shared between the buyer and suppliers is product related: price, volumes, quality and expected terms. Important factors in the final decision are: the total landed product costs and any associated non-recurring engineering, and the quality systems of the supplier. According to the three-phase model of Emden et al. (2006) the criteria based on which a supplier is selected can be expanded to create strategic and relational alignment as well.[218] Strategic alignment is especially important for supplier involvement and information sharing whereas it focusses on motivation and goal correspondence. Strategic alignment concerns compatible cultures, the propensity to adapt, and long-term orientation. Creating strategic alignment thus increases the chance information will be shared in the relationship.

During initial and operational purchasing procedures, only transactional actions are discussed. Hereafter the supplier management phase follows. This includes quality checks of the delivered products, corrective actions, performance measurement of suppliers, and quarterly business reviews. The majority of these actions focus on the worst performing suppliers, which means there are no processes on how to reward the suppliers with a good performance. Rewarding suppliers is important since it creates the feeling that the relationship adds value to their business. According to Hüttinger et al. (2012) expected value creation is one of the important factors that influence customer attractiveness and thereby preferred customer status. Finally, the

[218] See Emden et al. (2006), p. 334.

processes imply the case company tends to use more contractual governance mechanisms and less relational mechanisms. Where contractual mechanisms control for opportunism and coordinate expectations of the relationship[219], relational mechanisms consist of long-term agreements that are based on personal relationships, social norms, trust, and commitment[220]. These mechanisms are often related with collaboration; there is an expectation of knowledge sharing, development of asset specifity, and complementarity between partners.[221] So, in order to increase information sharing and early supplier involvement, the latter is preferred. For the case company this potentially means there should be a shift from the use of contractual mechanisms to an increased use of relational mechanisms.

In addition, in order to find out which factors strongly influence information sharing and early supplier satisfaction at the case company, several hypotheses are tested. These will be discussed in the following chapter. By means of a questionnaire the hypotheses will be tested.

4.2 Identification of hypotheses regarding antecedents of information sharing and supplier involvement

This research uses the social exchange theory as a framework for explaining how several antecedents relate to information sharing and early supplier involvement. In the above review of literature a range of antecedents has been identified, just as how the SET variables trust, commitment, power, and reciprocity influence information sharing or early supplier involvement. Based on the findings in the first model includes hypotheses addressing information sharing supplier involvement (figure 4). Furthermore, as the literature research suggests relationships between information sharing, and supplier satisfaction and customer attractiveness are established as well (figure 5). Lastly, this research replicates the model of Vos et al. (2016) using information sharing as additional variable.

According to SET trust is at the heart of every exchange relationship. If parties involved in such a relationship are able to establish trust, this enables positive expectations towards each other, just as a willingness to be vulnerable.[222] Thereby inter-organizational exchanges, like sharing

[219] See Malhotra and Lumineau (2011), p. 989.
[220] See Dyer and Singh (1998), p. 671; as well as Poppo and Zenger (2002), p. 707.
[221] See Dyer and Singh (1998), p. 671-675; as well as Poppo and Zenger (2002), p. 721; Mentzer et al. (2001), p. 13; and Brito and Miguel (2017), p. 62.
[222] See Rousseau et al. (1998), p. 394.

information or support in development processes, are supported.[223] In addition Wu et al. (2014) conclude that higher levels of trust can result in constant co-operation and communication, and Özer and Zheng (2017) argue trust is especially important within relationships in an information-critical setting such as early supplier involvement.[224] So, the importance of trust for both information sharing and early supplier involvement are recognized in the literature. We therefore assume trust enhances both information sharing and early supplier involvement.

> H1a: Trust has a positive influence on perceived information sharing between supply chain partners by the supplier.
> H1b: Trust has a positive influence on perceived early supplier involvement by the supplier.

Commitment is another crucial factor in buyer-supplier relationships. Just as trust, commitment tends to entail cooperation between relationship partners[225] and is seen as an essential ingredient for successful long-term relationships.[226] A committed partner will be willing to cooperate with the other party due to its desire to make the relationship work.[227] By taking actions or making investments that foster the continuation of a relationship like relationship-specific investments, a partner shows its commitment.[228] As increasing information exchange between supply chain partners requires effort and an increase in resource allocation, firms are more likely to exchange information with those partners who show commitment. Furthermore, if both partners behave as they are committed to the relationship this will contribute to the outcomes of cooperation, such as the development and commercialization of new products[229]. We therefore assume commitment is positively related to both information sharing and supplier involvement.

> H2a: Buyer-supplier commitment has a positive influence on information sharing between supply chain partners by the supplier.
> H2b: Buyer-supplier commitment has a positive influence on early supplier involvement.

Whereas according to the review power only has an indirect effect on information sharing and supplier involvement the only variable left to take into account is reciprocity. Reciprocity can

[223] See Poppo et al. (2016), p. 724.
[224] See Özer and Zheng (2017), p. 302.
[225] See Jeong and Oh (2017), p. 116.
[226] See G. G. Gundlach et al. (1995), p. 78; as well as Mentzer et al. (2001), p. 13.
[227] See Morgan and Hunt (1994), p. 26; and Mandal and Sarathy (2018), p. 201.
[228] See Jokela and Söderman (2017), p. 270.
[229] See Mazzola et al. (2015), p. 281-282; and Jokela and Söderman (2017), p. 270.

be seen as a transactional pattern of interdependent exchanges.[230] According to Wu et al. (2014) it facilitates information sharing.[231] Furthermore it is important for organizations to engage or invest in a relationship since reciprocity implies they have the feeling the participants in the relationship offer reciprocal benefits to one another over time. Such benefits are for example solidarity, sharing of additional information, or a willingness to work for the relationship. [232] So, establishing a reciprocal relationship implies increased sharing of information. And, whereas involving suppliers is a way of showing you are willing to work on a relationship the assumption is made reciprocity has a positive influence on early supplier involvement.

> H3a: Reciprocity has a positive influence on perceived information sharing between supply chain partners by the supplier.
> H3b: Reciprocity has a positive influence on perceived early supplier involvement by the supplier.

This research assumes a social exchange relationship characterized by trust, commitment, and reciprocity forms a stable basis for information sharing and supplier involvement. To establish such a relationship, all parties of this relationship have to obey the rules and norms of the exchange which are the "normative definition of the situation that forms among or is adopted by the participants in an exchange relation"[233] These social norms are relational mechanisms, often related with collaboration; there is an expectation of knowledge sharing, development of asset specifity, and complementarity between partners.[234] So, we assume having shared norms positively relates to information sharing and supplier involvement

> H4a: Having shared norms has a positive influence on perceived information sharing between supply chain partners by the supplier.
> H4b: Having shared norms has a positive influence on perceived early supplier involvement by the supplier.

[230] See Cropanzano and Mitchell (2016), p. 876.
[231] See Wu et al. (2014), p. 129.
[232] See Griffith et al. (2006), p. 88.
[233] Emerson (1976), p. 351.
[234] See Dyer and Singh (1998), p. 671-675; as well as Poppo and Zenger (2002), p. 721; Mentzer et al. (2001), p. 13; and Brito and Miguel (2017), p. 62.

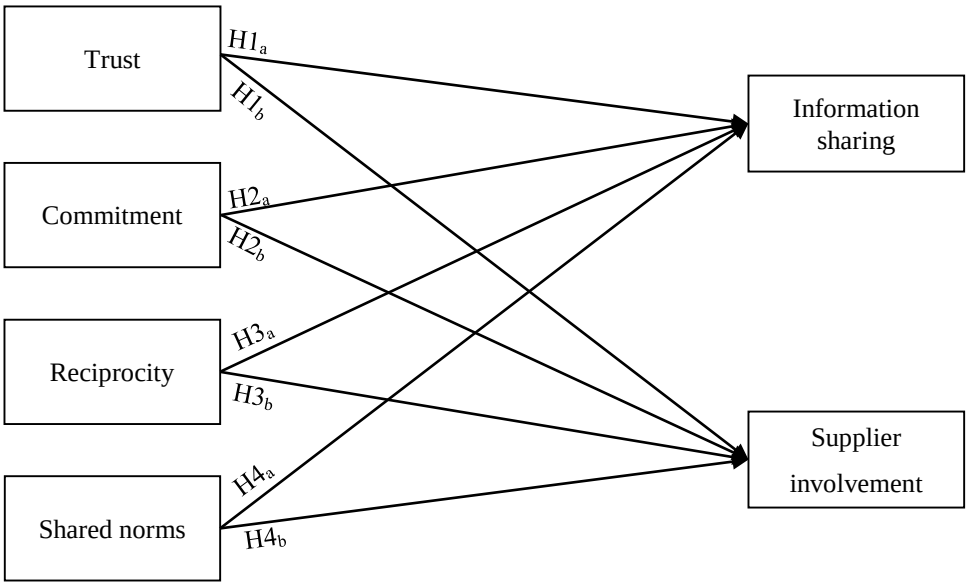


Figure 4 hypotheses regarding supplier involvement and information sharing

Furthermore, we add information sharing as an extra variable to the research of Vos et al. (2016). We assume information sharing is related to already existing variables in the model and thereby influences customer attractiveness as well as supplier satisfaction. Inter-organizational communication via which information is shared is conceptualized as a relational competency; it mediates between several antecedents and outcomes of a relation for the buyer and supplier.[235] First, in supplier involvement information sharing enhances the mutual understanding of expected benefits in terms of cost, quality, scheduling, roles and responsibilities that are associated with the supplier involvement efforts. This is important to the success of these efforts and thereby increase supplier satisfaction.[236] Second, information sharing is required for creating commitment in a relationship. The level of information sharing between the buyer and supplier is positively related to commitment. By means of showing behavioural commitment by one partner the commitment of the other party will increase. Examples of such behaviours are relationship-specific investments and information sharing.[237] Increasing behavioural commitment in a buyer-supplier relationship reduces the feeling of vulnerability among the parties of the relationship.[238] Furthermore, if both partners are committed to the relationship this

[235] See Carr and Kaynak (2007), p. 46.
[236] See Petersen et al. (2005), p. 376.
[236] See Petersen et al. (2005), p. 376.
[237] See Jokela and Söderman (2017), p. 270.
[238] See Shiu et al. (2014), p. 889-890.

contributes to the outcomes of cooperation, such as the development and commercialization of new products[239] and the creation of new sources of value and growth[240]. So, this reinforces our previous statement information sharing positively influences supplier involvement, and it also provides evidence to assume information sharing improves commitment. Besides commitment, trust can be influenced by information sharing as well. In order to achieve trusting relationship several aspects are important. According to Jeong and Oh (2017) trust often results from good communications, shared values, and high exit barriers.[241] In addition Mandal and Sarathy (2018) argue the exchange of timely information in a network builds trust and supply chain relationships. Since both commitment and trust are important in becoming an attractive supplier as well as for information sharing, we formulated the following hypothesis.

> H5a: The level of information sharing between the buyer and supplier is positively related to supplier satisfaction
> H5b: The level of information sharing between the buyer and supplier is positively related to customer attractiveness.

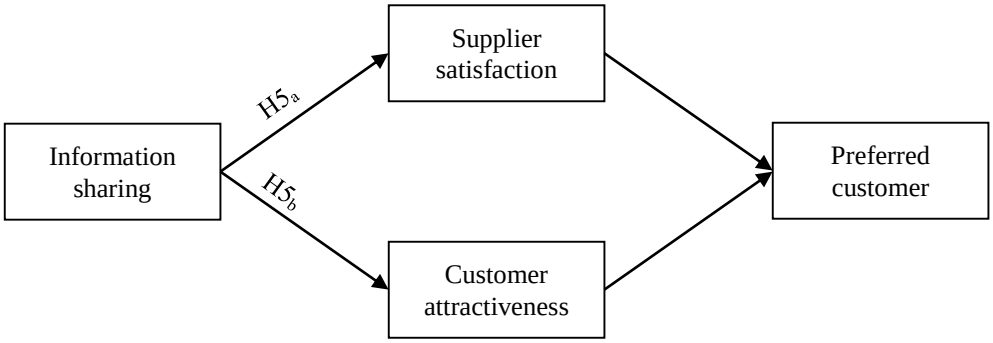


Figure 5: Hypotheses regarding preferred customer status

5 Using a quantitative approach to gather empirical evidence to prove hypotheses

5.1 Data gathering process

In order to test the previously stated hypotheses a quantitative approach was used. By means of a survey the data was gathered on site at the purchasing department of the case company in collaboration with the employees. They provided a data file according which 480 suppliers were

[239] See Mazzola et al. (2015), p. 281-282; and Jokela and Söderman (2017), p. 270.
[240] See Brady (2005), p. 372; and Jokela and Söderman (2017), p. 270.
[241] See Jeong and Oh (2017), p. 116.

active at least once during the past year. This includes purchases regarding production, new product introduction, transportation, and office supply and facilities. These suppliers are responsible for the delivery of production materials like for example: electronics, mechanical parts, and printing boards; or materials required for production, which are for instance: tin, glue, or office supplies. Whereas not every supplier in this list is assumed to be relevant to contact, first a selection had to be made. This selection was based on the frequency a purchaser bought something from the supplier. Suppliers at which just a small order was placed in that year were excluded. In collaboration with the buyers of the company a list of 235 accessible companies was produced. The contact information of these companies was already available, however, to make sure it was not outdated, a list of contact information of the organisations, which were to be contacted was send to the responsible operational purchaser. On the 10th of July the questionnaire was send to the suppliers, using individual links in order to be able to keep track of which organisation did not fill out the questionnaire. The deadline was set on the 27th of July due to the summer break during which many contact persons would be out of office. After each week a reminder was send via e-mail. In addition the operational purchasers encouraged the suppliers to finish the questionnaire by means of phone calls and e-mails.

In the end 55 responses were collected of which 48 were useful. The distribution of these responses are presented in table 1. Those surveys that were not useful were just partially completed. This resulted in a response rate of 20,4%. As suggested, the norm for a reliable response rate should be within one standard deviation from the average. Since this survey is distributed via e-mail to organizations using several reminders, the average response rate is 29.2 with a standard deviation of 12.2 according to Baruch and Holtom (2008).[242] This means the acceptable range is between 17% and 41.4%, which would result in an acceptable return rate for this study. Even though the response rate is compliant, only a response rate of 100% would provide a full set of data that represents the whole population. A smaller set of data thus is vulnerable to non-response bias. Non-response happens for two reasons: (1) the respondent did not receive the survey; or (2) it did not wish to respond.[243] By means of the up-to-date dataset this study aimed to prevent the first reason. So the assumption is made the other 80% did not

[242] See Baruch and Holtom (2008), p. 1151.
[243] See Baruch (1999), p. 423.

wish to respond. One of the reasons proposed by Baruch (1999) why employees do not want to respond is the intensity of research in the field of business and the flood of surveys send out to employees.[244] Another reason could be the timing of the e-mails, which was just before the summer break for many of the contacted organizations. Furthermore, several organizations mentioned they were not able to complete the questionnaire due to organisational constrictions or privacy issues.

In order to test if our set of data is vulnerable to non-response the Mann-Whitney U test was performed. Whereas in surveys assessing relationship issues between buyers and suppliers non-normally distributed data is frequently observed, Mann-Whitney U is a good alternative to the independent-sample t-test. The dataset is split into early and late respondents, treated as a proxy for non-responses. For every variable in the current study this test is performed in order to test if there are any significant differences between the two groups. The results can be found in appendix E. These show there are no significant differences between the groups for every variable except one: "Compared to other customers in our firm´s customer base our firm's employees prefer collaborating with the case company to collaborating with other customers." Even though one could assume organizations that prefer collaboration with the case company, are more willing to fill out the survey we still continue our analysis and assume, based on the Mann-Whitney U test, the dataset is not affected by non-response bias.

Table 1: descriptives dataset

Country of location		Position of respondent		Length of the relationship	
NL	64.6%	Sales department employee	43.8%	0-5 years	22.9%
USA	8.5%	Sales manager	8%	6-10 years	31.3%
Asia	6.3%	Head of sales department	20.8%	11-20 years	33.3%
Unknown	2.1%	Director/owner	12.5%	>20 years	12.5%
Missing	2.1%	Other	14.6%		
Total	100%	Total	100%	Total	100%

5.2 Questionnaire design

A questionnaire has been developed to test the hypotheses as well as how information sharing is related to supplier satisfaction, customer attractiveness and preferred customer status. It takes

[244] See Baruch (1999), p. 423.

approximately 15 minutes to fill in, and the questions can be answered using a 5-point likert scale. The body of questionnaire is build-up of five parts: (1) supplier satisfaction; (2) operational excellence; (3) perception of customer attractiveness; (4) information sharing; and (5) general information. Measurements that test supplier satisfaction and a selection of measurement variables for customer attractiveness are based on the papers of Hüttinger et al. (2014)[245] and Vos et al. (2016)[246]. The question groups of supplier satisfaction are contact availability, growth potential, innovation potential, operative excellence, collaboration, support, involvement, relational behaviour, profitability, and general satisfaction. This research made some changes to the question groups included in the part of customer attractiveness. Whereas the social exchange theory provides support for the explanations of antecedents and outcomes of information sharing, changes have been made in which items to include in the part of customer attractiveness. Based on the article of Blonska, Storey, Rozemeijer, Wetzels, and de Ruyter (2013) the question groups used by Vos et al. (2016) are replaced by: status; trust; commitment; and reciprocity are included.

The fourth part of the questionnaire is testing the level of information sharing between the supplier and the case company. In this part suppliers were asked to rate the degree of information sharing in general, the quality of the shared information, the use of several different information technologies, and to what extent they share norms and values with the case company. To assure validity and reliability of the measurement constructs, variables were derived from previous studies on information sharing. After a literature review a first selection of measurement variables was made. Next, this selection was send to prof. H. Schiele who provided feedback. Based on this some variables were adjusted or deleted, which resulted in the final selection of measurement variables for measuring information sharing. According to Monczka, Petersen, Handfield, and Ragatz (1998) and Li and Lin (2006) information sharing "(…) refers to the extent to which critical and proprietary information is communicated to one's supply chain partner"[247]. In line with this definition sharing proprietary information just as potentially critical information early on are used as measurement variables in this research. To complement these variables, informing the customer in advance of changing needs just as sharing business

[245] See Hüttinger et al. (2014), pp. 720-721.
[246] See Vos et al. (2016), p. 4620.
[247] Li and Lin (2006), p. 1643

knowledge in core business processes are included to measure information sharing in this research as well. Based on Li and Lin (2006) quality of information sharing is an important factor in measuring information sharing as it adds an extra dimension in the advantages of information sharing: "(…) quality information sharing contributes positively to customer satisfaction and partnership quality".[248] As discussed before the aspects of information quality are discussed by several research papers. Whereas there are no great differences, for the purpose of consistency this paper adopts the measurement constructs of Li and Lin (2006): accuracy, timeliness, adequacy, and credibility, are adopted by this research.

Besides the SET variables that influence information sharing and its quality, three other variables have been identified: The use of information technology, shared cognitive norms and values, and frequency of communication. For both shared cognitive norms and values, and frequency of communication, question groups were created by combining measurement variables used in the of Villena et al. (2011). Including these additional variables provides us with further information on how SET variables relate to information sharing.

The final part of the questionnaire comprises control variables which address several characteristics of the supplier and its relationship with the case company. Variables like supplier size, turnover, number of employees, length of the relationship, and function of the respondent are included. By including these variables deeper analyses can be performed on if the size of an organization or length of the relationship influences the outcomes of the questionnaire. In addition the respondent is asked to rate his or her knowledge of the relationship with the case company. This question helps to rule out any unusable questionnaires.

5.3 A thorough assessment of the reliability and validity of measurement constructs

To test the hypotheses structural equation modelling (SEM) is used. Structural equation modelling can be used to test theoretical assumptions with empirical data. Instead of earlier used regression-based approaches it allows the researcher to simultaneously model relationships among several different endogenous (dependent) and exogenous (independent) latent constructs.[249] In general, two approaches exist to estimating parameters within SEM: the covariance-based approach and the variance-based approach. Where the covariance-based

[248] Li and Lin (2006), p. 1642
[249] See Haenlein and Kaplan (2004), p. 285; and Ainuddin, Beamish, Hulland, and Rouse (2007), p. 56.

approach attempts to reproduce the covariance matrix, the variance-based approach aims to maximise the explained variances by combining theoretical and empirical knowledge.[250] For the purpose of this research the variance-based SEM method PLS is used. It is believed this is an appropriate approach for the following reasons. First, SEM-PLS is a method which can be used in case a complex model is to be tested while using a relatively small dataset.[251] Second, PLS is particularly suited for exploratory studies, using new constructs measures and testing new relationships between constructs.[252] And lastly, in previous studies on this topic performed by for example Hüttinger et al. (2014), Pulles et al. (2016) and Vos et al. (2016) the use of this test is proven to be appropriate. The created PLS path model exists of the structural model which represents the hypotheses (see fig. 4) and of the reflective model which describes the relationship between the unobserved variables (i.e. information sharing) and observed variables (i.e. the measurement items).

When using PLS-SEM a thorough assessment is required whereas it is a multivariate analysis technique. Both the reliability and validity of the measurement constructs were tested by several statistical tests based on a path analysis and bootstrapping using SmartPLS 3.0.[253] However, before the reliability and validity were assed, first items that do not significantly contribute to measuring its underlying construct were deleted.[254] For both models a factor analysis is performed in SPSS, using principal axis factoring with a varimax rotation. Based on the rotated result of this analysis every variable with a value lower than 0.5 is deleted. This process ensures scale unidemensionality[255]. The results of the factor analyses can be found in appendix F.

In addition to the importance of a block of items reflecting a latent construct being unidimensional, it also has to be homogenous. This can be tested using either Cronbach's alpha or Dillon-Goldstein's rho, also known as Composite Reliability. Cronbach's alpha assumes each variable is of equal importance which results in a lower bound estimate of reliability if a multi-variate analysis is used. Composite Reliability does not makes this assumption as it is based on the loadings of the items in the model. Therefore, Composite Reliability is regarded the most

[250] See Haenlein and Kaplan (2004), p. 285.
[251] See Hair, Ringle, and Sarstedt (2014), p. 140.
[252] See Ainuddin et al. (2007), p. 56.
[253] See Ringle, Wende, and Becker (2015)
[254] See Andreev, Heart, Maoz, and Pliskun (2009), p. 7.
[255] See Andreev et al. (2009), p. 7.

appropriate method in case of partial least squares analysis.[256] So, in order to check for homogeneity Composite Reliability is used of which the results can be found in Table 2 and 3. According to this test a block of items in an exploratory research is considered homogenous if the index of a block is larger than 0.6.[257] This threshold is met for every variable in both models.

Table 2: Construct Reliability and AVE – hypotheses regarding information sharing and supplier involvement

	Composite Reliability	**Average Variance Extracted (AVE)**
Information sharing	0,858	0,752
Trust	0,965	0,872
Commitment	0,924	0,802
Involvement	0,907	0,766
Reciprocity	1,000	1,000
Shared norms	0,920	0,658

Table 3: Construct Reliability and AVE - hypotheses regarding preferred customer status

	Composite Reliability	**Average Variance Extracted (AVE)**
Customer attractiveness	0.970	0.915
Information sharing	0.864	0.761
Preferred customer status	0.938	0.753
Supplier satisfaction	0.932	0.734

Lastly, to address construct validity a principal component analysis was conducted which includes both convergent and discriminant validity. Convergent validity means that the average variance extracted (AVE) should be higher than 0.5.[258] If it is lower than 0.5, this would mean that the latent variable explains less than half of the variance in its indicators' variance. As can be seen, this threshold is met for both models. To measure discriminant validity the Heterotrait-monotrait (HTMT) ratio of correlations test is used. This test estimates the correlation between two constructs. So, if a value is clearly smaller than one, the correlation between the two constructs is most likely to be different from one. If the value is larger than 0.85 this indicates a lack of discriminant validity.[259] With a maximum value of 0.770 this threshold is met. The

[256] See Vinzi, Trinchera, and Amato (2010), pp. 50-51.
[257] See Hair et al. (2014), p. 145.
[258] See Hair et al. (2014), p. 111.
[259] See Henseler, Ringle, and Sarstedt (2014), p. 121.

results of this test can be found in Appendix G. To conclude, both convergent and discriminant validity are met.

6 Finding evidence for the importance of shared norms for information sharing

Based on the proposed hypothesis in chapter four, three hypothetical models have been established. These models are tested and calculated using SmartPLS 3.0 consistent bootstrapping using 500 subsamples.[260] Whereas each hypothesis implies either a positive or negative relation between constructs, the test is one-tailed with a significance level of 0,05.[261] The analysis of the model is largely based on two measures: the R^2 values of the endogenous variables, the amount of variance explained by other latent variables, and the significance levels of the path coefficients.[262] In this research the models 'hypotheses regarding information sharing and early supplier involvement' there are two endogenous variables: information sharing (R^2: 0,258) and supplier involvement (R^2: 0,099). The model 'hypotheses regarding preferred customer status' has supplier satisfaction (R^2: 0,005); customer attractiveness (R^2: 0,167); and preferred customer status (R^2: 0,528) as endogenous variables. An R^2 value of 0 indicates that the latent variables explain nothing of the variability in the endogenous variable and a value of 1 indicates all variability is explained by the latent variables. For a more precise interpretation this research adopts the following: values of 0.25, 0.5 and 0.75 respectively are regarded as weak, moderate and substantial.[263] So, overall the latent variables merely explain the variation in the endogenous variables.

Table 4 Path and T-values

Hyp.	Path			Coefficient beta	T-value
H_{1A}	Trust	→	Information sharing	-0,140	0,561
H_{1b}	Trust	→	Supplier involvement	-0,147	0,425
H_{2a}	Commitment	→	Information sharing	-0,064	0,210
H_{2b}	Commitment	→	Supplier involvement	-0,166	0,518
H_{3a}	Reciprocity	→	Information sharing	0,133	1,132
H_{3b}	Reciprocity	→	Supplier involvement	0,063	0,392
H_{4a}	Shared norms	→	Information sharing	0,566	2,463
H_{4b}	Shared norms	→	Supplier involvement	-0,064	0,236
H_{5A}	Information sharing	→	Supplier satisfaction	0.072	0.449

[260] See Wong (2013), p. 25.
[261] See Kock (2015), p. 7.
[262] See Hair et al. (2014), p. 113.
[263] See Hair et al. (2014), p. 145.

H_{5B}	Information sharing	→	Customer attractiveness	0.409	3.639

Hereafter, the value and significance of the path coefficients are examined, of which the results are shown in table 4. Smart-PLS provides us with the standardized coefficient beta and the T-value of each analysed path. If the T-value is smaller than 1.69, and thus the effect is not found to be significant, this study was not able to find evidence that supports the hypotheses.[264] Furthermore, if a path has a standardized beta coefficient that is not in line with the hypothesised direction this hypothesis is not supported by this research. Whereas every hypothesis addresses a positive relation and the relationships between trust and information sharing (H_{1a}: β=-0.140; T=0.561); trust and early supplier involvement (H_{1b}: β=-0.147; T=0.425); commitment and information sharing (H_{2a}: β=-0.064; T=0.210); commitment and early supplier involvement (H_{2b}: β=-0.166; T=0.518); and shared norms and supplier involvement show a negative path value (H_{4b}: β=-0.064; T=0.236), these hypotheses are not supported by this model. In addition, the relationship between reciprocity and information sharing ($H_{3a:}$ β=0.133; T=1.132); reciprocity and early supplier involvement ($H3_{b:}$ β=0.063; T=0.392); and information sharing and supplier satisfaction ($H_{5a:}$ β=0.072; T=0.449) do not meet the threshold of a T-value of at least 1.69. Therefore these hypotheses are not supported by this research.

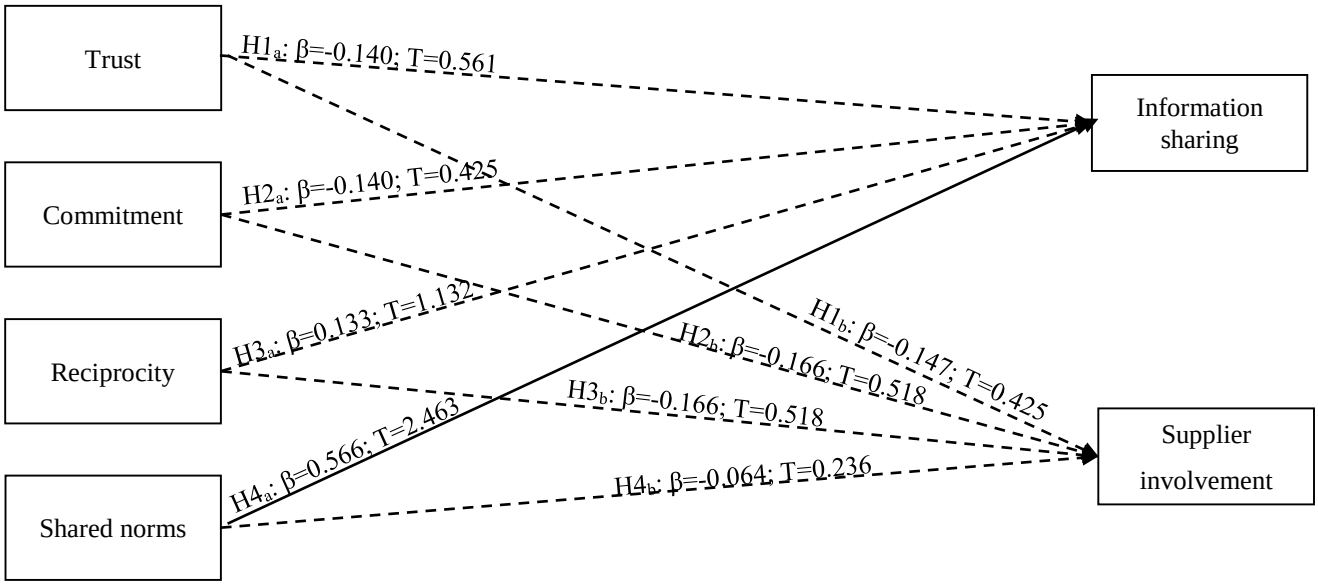


Figure 6: results 'hypotheses regarding information sharing and early supplier involvement'

[264] See Wong (2013), p. 25.

As can be seen in figures 7 and 8 just one hypothesis regarding the relationship between SET variables and information sharing and supplier involvement ($H4_a$: β=0.566; T=2.463) is proven significant by this research. As for the hypotheses regarding the relationship between information sharing, and supplier satisfaction and customer attractiveness, a significant relationship is found as well between information sharing and customer attractiveness ($H5_b$: β=0.409; T=3.639). So, using a one-tailed bootstrapping test with a significance level of 0.05 two of the hypothesized paths are proven to be significant.

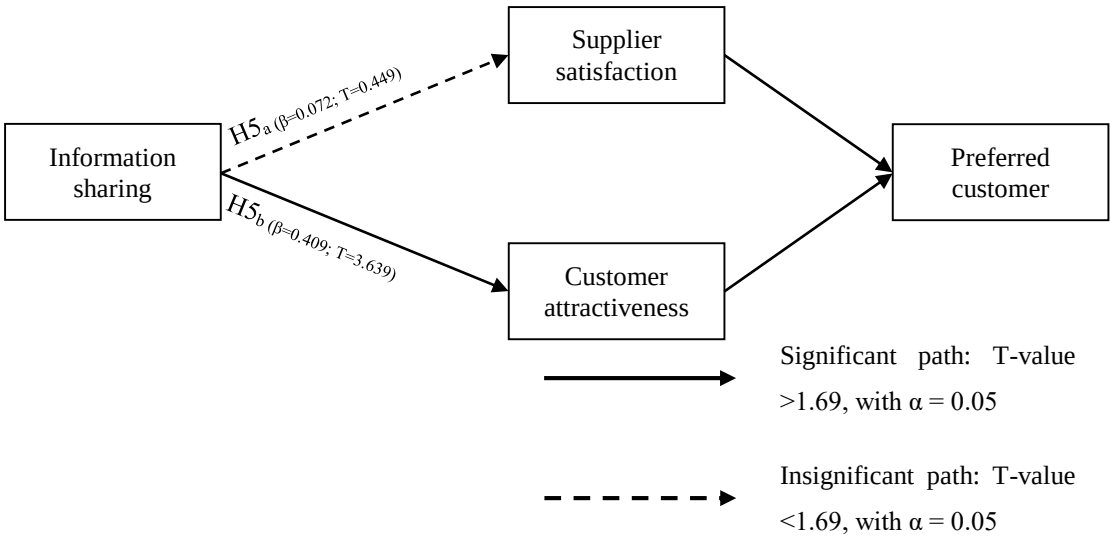


Figure 7: Results 'hypotheses regarding the influence of information sharing on preferred customer status'.

Whereas the questions for measuring early supplier involvement and information sharing are different to some extent: the questions regarding early supplier involvement measure the extent to which the supplier feel they are involved by the case company, while the questions regarding information sharing measure the extent the supplier feel they share information with the case company, the results of the model presented in Figure 6 are replicated. In this replicated model the hypotheses concerning early supplier involvement are reversed. However, the results are even less significant and we therefore assume these variables are able to measure the hypotheses with the initial direction. The results of this analysis can be found in Appendix H.

7 Necessity of further research regarding the relationship between SET, information sharing, early supplier involvement, and preferred customer status.

7.1 The influence of shared norms on information sharing and consequently, information sharing on preferred customer status

The goal of this research was twofold. First, it aimed to identify relevant antecedents of information sharing and supplier involvement and how strongly their influence is on either information sharing or early supplier involvement. The purpose of this part of the research is to support the advice given to the case company to improve both information sharing and early supplier involvement. A review on social exchange and information sharing literature resulted in trust, commitment, reciprocity, and shared norms being taken into account as important variables that influence information sharing and supplier involvement. In addition, literature on preferred customer status has also been reviewed, which resulted in the conclusion preferential treatment does not precede information sharing.

Despite the conclusions drawn from the literature review on the importance of the SET variables for information sharing, this study was only able to provide supporting evidence for shared norms to have a positive effect on information sharing. As mentioned before this research assumes a social exchange relationship characterized by trust, commitment, and reciprocity forms a stable basis for information sharing and supplier involvement. To establish such a relationship, all parties of this relationship have to obey the rules and norms of the exchange which are the "normative definition of the situation that forms among or is adopted by the participants in an exchange relation"[265] It can therefore be that there is a relationship between trust, commitment, and information sharing or supplier involvement, however it is indirect or influenced by having shared norms.

Second, it makes an attempt to contribute to the model of Vos et al. (2016) by both creating a simple model were the influence of information sharing on both customer attractiveness and supplier satisfaction is tested, and replicating the original model while adding an extra variable: information sharing. This research showed there is a significant positive relationship between

[265] Emerson (1976), p. 351.

information sharing and customer attractiveness which implicates that by improving information shared a company as a customer is perceived more attractive by a supplier. The replication of the model showed some interesting findings as well as four paths were not proven to be significant: support → relational behaviour; supplier involvement → relational behaviour; operative excellence → supplier satisfaction; and growth → supplier satisfaction. This contradiction with previous studies can be caused by the small sample size of this study, or a misfit with the proposed model and the high-tech industry of printed circuit boards. The other paths were all highly significant including the effect of information sharing on relational behaviour.

Although this thesis was not able to show significant relationships for every proposed hypothesis, it does have some managerial implications. First, as it was one of the goals of this research to identify important antecedents of information sharing. Since organizations cannot focus on every aspect which might be related to improving information sharing with suppliers, it is important to know which improvement or changes have a significant impact. This study was able to provide empirical evidence for the significant effect of shared norms on information sharing. Organizations need to be aware of the relationships it has with its business partners with which they have shared norms, interests, or goals, as this is an important antecedent for sharing information.

Third, the findings show information sharing has a positive effect on customer attractiveness and supplier satisfaction. As Wilkinson et al. (2005) and Hüttinger et al. (2014) argue suppliers will only invest in a relationship with a customer if that supplier is perceived attractive[266], it is relevant for organizations to invest in becoming an attractive customer. Additionally, a more recent study of Pulles et al. (2016) showed customer attractiveness positively influences supplier satisfaction which positively impacts the tendency of a supplier to award a customer with a preferred customer status and eventually give it a preferential treatment. Hence, it is a means to gain competitive advantage on the supply-side of the market.[267]

Besides its managerial implications, theoretical implications can be drawn as well. This study provides additional empirical data which provides insights in the relationship between preferred

[266] See Wilkinson et al. (2005), p. 678; and Hüttinger et al. (2014), p. 698.
[267] See (Pulles et al., 2016)

customer status, supplier satisfaction, and its antecedents. Furthermore it has shown information sharing has a positive influence on relational behaviour which is one of the antecedents of supplier satisfaction. And it provided insights in the relationship between a social exchange relationship and information sharing. It showed both trust and having shared norms have a direct positive influence on information sharing. Notwithstanding the fact the direct effects of commitment and reciprocity on information sharing, and every variable derived from the social exchange theory on supplier involvement, further research can be performed on the indirect effects of these variables.

7.2 The significant influence of information sharing on supplier satisfaction asks for further research

This research has several limitations which need to be taken into account. In regards with gathering the data several issues have to be addressed. First, he case company provided a list of 300 suppliers of which 50 suppliers responded. This small number of respondents makes the conclusions drawn from this research less reliable. Furthermore, as just one representative of a large organization fills out the questionnaire this valuation is influenced by the opinion of that one person. It can be the opinion of this person is not in line with the general opinion of the organization. The social aspects of the questionnaire are especially vulnerable to this type of bias. To minimize this effect more than one employee of the firm could have been approached to fill out the questionnaire after which the responses could be compared, however, this could have resulted in an even lower number of respondents. Second, the purchasers of the case company contributed to the data gathering process. After every call with a supplier they addressed this research and asked the supplier to fill out the questionnaire. Suppliers which had good relationships with the purchasers were more willing to fill out this questionnaire. This may have caused relatively more suppliers with a positive attitude towards the case company have respondent to our request to fill out the survey. Third, companies could leave their e-mail address to receive a copy of the results of this research. This could give the supplier the impression the case company was able to trace back the results of the questionnaire. And even though it was mentioned several times the questionnaire could not be used as a marketing tool, it is still possible companies did use it as a marketing tool.

Just as the data gathering process, the outcome of this research shows some limitations as well. First, according to this research, no social exchange variables have a significant impact on supplier involvement and only the variable shared norms significantly influences information sharing. This problem might not have occurred if a larger and more diverse sample sized was used or if indirect effects were taken into account in this research. Second, the replicated model of Vos et al. (2016) shows no significant effect of operative excellence and growth opportunity on supplier satisfaction which contradicts previous studies. It can be that either the model is not applicable to this specific industry, or the sample size is too small.

The low number of antecedents proven to have a significant effect on information sharing or supplier involvement leads to a number of suggestions for future research. The first suggestion is to perform a similar study with a larger sample size derived from different industries in order to find reliable evidence on the significance of the relationships and make the study generalizable. Furthermore, in the future studies should to focus just on supplier involvement or just on information sharing. Even though they have many similarities, these are different subjects with probably some differences at least in the importance of the antecedents. Also, different types of information sharing exist which is important to take in mind. Whereas commitment or frequency of information sharing might not be important to sharing for example operational information, these variables can have a significant impact on sharing strategic information. So, further research should be performed on the effect of social exchange variables on information taking into account the type of information.

As for supplier satisfaction research, the effects of operative excellence and growth should be further examined whereas they did not show a significant effect. However, as Vos et al. (2016) mentioned, the impact of antecedents could vary depending on a number of factors like product, and characteristics of the supplier and its environment. It is therefore interesting for future research, using a larger sample, to find out if this model fits to the high-tech PCB industry, as well as to others.

Appendices

A. Summary definitions, antecedents and outcomes of core concepts

Table 5: definitions, antecedents and outcomes core concepts

	Definition	**Antecedents**	**Outcomes**
Preferred customer status	A buyer with a preferred customer status gains early access to supplier resources.[268] Furthermore it receives a preferential treatment that includes benefits like early access to innovations[269], better prices[270,] and delivery in times of scarcity[271]	Relevant examples are: a large share of sales; satisfaction with obtained value; early and close involvement in NPD; adherence to agreements; supplier development; high perceived profitability; willingness to intensify the relationship; future business opportunities; having a cross-functional contact person; and communication[272].[273]	Early access to supplier resources[274]; innovations[275]; better prices[276;] and delivery in times of scarcity.[277]
Early supplier involvement	"(…) the extent to which a buyer organization shares responsibility with a	Relevant examples are: commitment and trust; frequent communication[279]; sharing sensitive	Improved decision making; exchange of knowledge[285]; the cycle of design,

[268] See Hüttinger et al. (2014), p. 697.
[269] See Schiele et al. (2011), p. 16.
[270] See Schiele et al. (2011), p. 16.
[271] See Baxter (2012), p. 1255.
[272] See Hüttinger et al. (2012), p. 1200.
[273] See Hüttinger et al. (2014), p. 702; as well as Pulles et al. (2016), p. 131-139; and Vos et al. (2016), p. 4620.
[274] See Hüttinger et al. (2014), p. 697.
[275] See Schiele et al. (2011), p. 16.
[276] See Schiele et al. (2011), p. 16.
[277] See Baxter (2012), p. 1255.
[279] See Jeong and Oh (2017), p. 116.
[285] See Chang (2017), p. 131.

	supplier organization for the development of design of the subsystem (component) of a new product."[278]	information[280]; resource allocation from both the customer and supplier[281]; partners should understand each other's capabilities and design expertise[282]; an effective supplier selection process[283]; and governance mechanisms[284].	testing, and re-design shortens;[286] it can improve design quality[287] that enables standardization of components and reduced engineering changes and product complexity;[288] and it can improve communication and information sharing between the buyer and supplier.[289]
Information sharing	"(…) information sharing between the firms refers to information shared between a buyer and key suppliers that is detailed enough,	Relevant examples are: Trust and commitment[291]; fitting and integrated information technologies[292]; face-to-face commitments[293]; network governance; long-	Reduced bullwhip effect; reduced overall inventories[296]; allows for early problem detection; provides a firm with

[278] Hoegl and Wagner (2016), p. 531; based on Takeishi (2001), p. 409.
[280] See Parker et al. (2008), p. 74.
[281] See Rajkumar and Stentoft (2017), p. 195.
[282] See Parker et al. (2008), p. 74-75.
[283] See Petersen et al. (2005), p. 372.
[284] See Kam and Lai (2018), p. 240.
[286] See Bonaccorsi (1994), p. 136.
[287] See Wasti and Liker (1997), p. 151; and Schiele (2010), p. 139
[288] See Bonaccorsi (1994), p. 137; as well as Kaipia and Turkulainen (2017), p. 122.
[289] See R.. McIvor and Humphreys (2004), p. 180.
[291] See Fawcett et al. (2007), p. 359.
[292] See Surati and Shah (2014), p. 1758-1761
[293] See Fawcett et al. (2007), p. 359.
[296] See Huang et al. (2003), p. 1492-1499.

frequent enough, and timely enough to meet a firm's requirements."[290]	term orientation[294]; and high exit barriers[295].	a possible route for outsourcing.[297]

[290] Carr and Kaynak (2007), p. 349.
[294] See Paulraj et al. (2008), p. 57.
[295] See Jeong and Oh (2017), p. 116.
[297] See R.. McIvor and Humphreys (2004), p. 180.

B. Survey for suppliers

Table 6: Survey suppliers

Survey questions English	**Source**	**Statistics**
General info: Since we will present the findings of this study on an aggregated level, the buyer will not be able to trace-back your individual answers. As a result, this survey cannot be used as marketing tool by your firm to make a positive impression on the buyer, but only as a tool to suggest points for improvement. So please give honest answers!		
Supplier satisfaction Introduction: The following questions relate to the core-aspects of supplier satisfaction: your economical, operational, relational and communicative satisfaction with the customer. The answers of all suppliers will be aggregated and thus your answers will be anonymized. Please give your honest answers! Per statement you can give only one answer.		
Contact accessibility: *There is a contact person within the case company who…* …coordinates the relevant relationship activities within and outside of the case company.	Vos et al. (2016); Walter (2003)	

…is, for the employees of our company, the one to contact in regard to partner-specific questions.	
…informs employees within the case company about the needs of our company.	
Growth potential for your company: *The relationship with the case company...*	Vos et al. (2016); Liu et al. (2009)
... provides us with a dominant market position in our sales area.	
... is very important for us with respect to growth rates.	
... enables us to attract other customers.	
... enables us to exploit new market opportunities.	
Innovation potential	Vost et al. (2016); Goodale et al. (2011)
In collaborating with the case company, our firm developed a very high number of new products/services.	
In collaborating with the case company, our firm was able to bring to market a very high number of new products/services.	
The speed with which new products/services are developed and brought to market with the case company is very high.	
Customer's operative excellence: *The case company...*	Vos et al. (2016); Hüttinger (2014) = dissertation
... has always exact and in time forecasts about future demand.	
... provides us with forecasts our firm can rely and plan on.	

... has for our firm simple and transparent internal processes.	
... supports short decision-making processes.	
… stands open for process optimizations.	
… has an optimal payment habit.	
Customer's reliability: *In working with our company, the case company...*	Vos et al. (2016); Gundlach et al. (1995)
... provided a completely truthful picture when negotiating.	
... always negotiated from a good faith bargaining perspective.	
... never breached formal or informal agreements to benefit themselves.	
... never altered facts in order to meet its own goals and objectives.	
Support: *The case company...*	Vos et al. (2016); Ghijsen et al. (2010)
... collaborates with us to improve our manufacturing processes or services.	
... gives us (technological) advice (e.g. on materials, software, way of working).	
... gives us quality related advice (e.g. on the use of inspection equipment, quality assurance procedures, service evaluation).	
Involvement	Primo & Amundson (2002)
We are early involved in the new product/service development process of the case company.	
We are very active in the new product development process of the case company.	

Communication with our firm about quality considerations and design changes is very close.	
Customer's relational behavior	Vos et al. (2016)
Problems that arise in the course of the relationship are treated by the case company as joint rather than individual responsibilities.	
The case company is committed to improvements that may benefit our relationship as a whole and not only themselves.	
We each benefit and earn in proportion to the efforts we put in.	
Our firm usually gets at least a fair share of the rewards and cost savings from our relationship with the case company.	
The case company would willingly make adjustments to help us out if special problems/needs arise.	
The case company is flexible when dealing with our firm.	
The collaboration with the case company's operational/specialist department is very good.	Vos et al. (2016)
Economic performance / Profitability: *The relationship with the case company...*	Pulles (2017)
... provides us with large sales volumes.	
... helps us to achieve good profits.	
... allows us to gain high margins.	
... has a positive influence on the profitability of our firm.	

... enables us to raise our profitability together.		
Customer Satisfaction	Pulles (2017)	AVE = 0.83; α - 0.80; CR = 0.91
Our firm is very satisfied with the overall relationship to the case company.		
On the whole, our firm is completely happy with the case company.		
Generally, our firm is very pleased to have the case company as our business partner.		
If we had to do it all over again, we would still choose to use the case company.		
Our firm does not regret the decision to do business with the case company.		
Our firm is satisfied with the value we obtain from the relationship with the case company.		
If you compare the case company to your (next) best customer according to each category, how would you compare it? *The case company is performing on...*	New	
… Contact accessibility		
… Growth potential for your company		
... Innovation potential		
... Customer's operative excellence		

... Customer's reliability	
... Support	
... Involvement	
... Customer's relational behaviour	
... Economic performance / Profitability	
Operational excellence	
Forecast and planning: *The case company has...*	Essig & Aman (2009)
… exact and timely forecasts about future demand.	
… provides us with forecasts our firm can rely and plan on.	
… good time schedule for its orders (no unexpected rush orders).	
… adheres to agreements without later changes.	
Ordering process: *The case company...*	Essig & Aman (2009)
… no special packaging and delivery requirements.	
… good support for first-time deliveries.	
… acceptable and well communicated delivery deadlines.	
…. well-functioning and uncomplicated receiving procedures (inspections).	
Payment: *The case company has...*	Essig & Aman (2009)
… reliable payment habits.	
… quick and unproblematic payment.	
… little interaction need to settle payment.	

Quality of processes: *The case company has...*	Essig & Aman (2009)
… has for our firm simple and transparent internal processes.	
… sophisticated IT systems.	
… supports short decision making processes.	
… uncomplicated and transparent processes.	
… state-of-the-art support systems and modern processes.	
Perception of customer attractiveness	
Preferred Customer Status: *Compared to other customers in our firm´s customer base…*	vos et al. (2016); Schiele et al. (2011b)
… the case company is our preferred customer.	
... we care more for the case company.	
... the case company receives preferential treatment.	
… we go out on a limb for the case company.	
... our firm's employees prefer collaborating with the case company to collaborating with other customers.	
Preferential treatment: *Our firm...*	Vos et al. (2016); Newbert (2008); Schiele et al. (2011b)
... allocates our best employees (e.g. most experienced, trained, intelligent) to the relationship with the case company.	

… allocates more financial resources (e.g. capital, cash) to the relationship with the case company.		
… grants the case company the best utilization of our physical resources (e.g. equipment capacity, scarce materials).		
… shares more of our capabilities (e.g. skills, know-how, expertise) with the case company.		
Customer attractivenes: *These questions are about the expectations you have of the relationship with the case company.*	Pulles (2017); Pulles (2016)	AVE = 0.84; α = 0.81; CR = 0.91
We consider the case company to be an attractive partner for future collaborations.		
We expect positive outcomes from the relationship with the case company.		
Our firm has positive expectations about the value of the relationship with the case company.		
Status: *According to us ...*	Praas (2016)	
... the case company has a high-status.		
... the case company is admired by others.		
... the case company has a high prestige.		
... the case company is highly regarded by others.		

Trust: *Our firm and the case company*	McKnight et al. (2002); Kumar et al. (1998); Hüttinger (2014) = Dissertation; Blonska et al. (2003)
… Consider own interests as well as others.	
… Trust in each other to keep the best interest in mind.	
… Count on each other to follow through with promises.	
… have mutual trust between us.	
Commitment: *Our firm and the case company*	Kumar et al. (1994); Benton & Maloni (2005); Morgan & Hunt (1994); Blonska et al. (2013)
… Find it pleasant to work with each other.	
… Want to remain in the relationship.	
… Are attracted by what the other party represents as a firm (image, brand, reference etc.).	
Reciprocity: *Your firm and the case company…*	Blonska et al. (2013)
… Consider the relationship as mutually beneficial.	
… Feel indebted because of what the other does for each other.	
… Expect to also work on further project in the future.	
… Have mutual respect between parties.	
Information sharing	
Quantity of interaction: *Our firm and the case company…*	Villena et al. (2011)
… Frequently communicate with each other.	

… Frequently communicate at different levels.	
… Frequently communicate between different functions.	
… Have a close personal interaction between the parties.	
… Have a personal friendship between the parties.	
… Have common project reviews.	
… Use internal linking systems.	
Cognitive shared norms and values: *Our firm and the case company…*	Villena et al. (2011)
… Interpreted situations in the same way / had the same approaches to business dealings.	
… Had a common understanding about what is allowed / not allowed.	
… Had the same vision of business in the relationship.	
… Have a similar corporate culture / values and management style.	
… Have compatible goals / similar targets.	
… Are aware of each other's objectives / KPIs	
Information sharing - general.	Li & Lin (2006)
Our firm shares proprietary information with the case company.	
We inform this customer in advance of changing needs of our company.	
We share business knowledge of core business processes with the case company.	
We share potentially critical new information with this customer early on.	

Information quality: *To what extent is the information that is shared between your firm and the case company meeting your requirements being…*	Li & Lin (2006)
… Timely enough?	
… Accurate enough?	
… Complete enough?	
… Adequate enough?	
… Reliable enough?	
Information sharing technology: *To what extent does the case company regularly use the following methods to communicate with you?*	Carr & Kaynak (2007)
Telephone	
Fax	
E-mail	
Face-to-face	
Enterprise Resource Planning (ERP)	
Social media (whatsapp, facebook etc.)	
Electronic Data Interchange (EDI)	
General information	Vos et al. (2016)
You reached the final part of the questionnaire. Please provide us with general information about the relationship with the case company.	
Length of relationship (in years)	

How long has your company been a supplier of the case company?

How long have you already been working as an employee of your firm?

How long have you already been acting as a sales representative for your company?

How long have you, as a representative of your firm, already been cooperating with the case company?

The other party expects us to be working with them for a long period of time?

General information

Please indicate the annual turnover with the case company as % of your annual turnover (in %, 0=lowest, 100=highest, e.g. if your company is having half of its turnover at the case company, fill-in "50")

Country of headquarters

Country of your location

Number of employees

Please could you categorize your classification and product description according to ecl@ss http://www.eclasscontent.com (Please visit this website for your classification)

If you know your ecl@ss in more detail, please write it here

In which of the following sector would you place your company

In your company, who has the most influence on determining the status of a customer?

O

Type firm: ownership state/private

Specification: How much influence does the case company have on your product/service design specifications?

How much influence does the case company have on your product/service design specifications? (in %, 0=lowest, 100=highest)

The survey will be completely anonymous towards the case company, but if you reveal your name towards the university this would help with the scientific analysis. Name of your company (optional):

Personal information

What is your position in the company?

I know the case company good enough to answer all the questions in this questionnaire

Outro

If you would like to receive the results of this study, please leave your e-mail address:

Do you have any additional comments or remarks? Please leave them here

C. Measurement codes and variables

Table 7: Measurement items PLS-SEM

Name latent variable	Code latent variable	Codes observed variables
Preferential treatment	PC_PrefTreat_120	PC_PrefTreat_120_1
		PC_PrefTreat_120_3
		PC_PrefTreat_120_4
		PC_PrefTreat_120_5
Preferred customer status	PC_PC_110_1	PC_PC_110_2
		PC_PC_110_3
		PC_PC_110_4
		PC_PC_110_5
		PC_PC_110_6
Supplier satisfaction	S_Satisfaction_100	S_Satisfaction_100_1
		S_Satisfaction_100_2
		S_Satisfaction_100_3
		S_Satisfaction_100_4
		S_Satisfaction_100_5
		S_Satisfaction_100_6
Customer attractiveness	PC_Attractiveness_126	PC_Attractiveness_126_1
		PC_Attractiveness_126_2
		PC_Attractiveness_126_3
Contact accessibility	S_Available_10	S_Available_10_1

		S_Available_10_2
		S_Available_10_3
Growth	S_Growth_20	S_Growth_20_1
		S_Growth_20_2
		S_Growth_20_3
		S_Growth_20_4
Innovation potential	S_InnovationPot_30	S_InnovationPot_30_1
		S_InnovationPot_30_2
		S_InnovationPot_30_3
Operative excellence (old)	S_OperativeExc_40_1	S_OperativeExc_40_2
		S_OperativeExc_40_3
		S_OperativeExc_40_4
		S_OperativeExc_40_5
		S_OperativeExc_40_6
		S_OperativeExc_40_7
Operational excellence (new)	O_Excellence	Is explained just by latent variables (η15-18)
Customer reliability	S_Collaboration_50	S_Collaboration_50_1
		S_Collaboration_50_2
		S_Collaboration_50_3
		S_Collaboration_50_4

Support	S_Support_60	S_Support_60_1
		S_Support_60_2
		S_Support_60_3
Involvement	S_Involvement_70	S_Involvement_70_2
		S_Involvement_70_3
		S_Involvement_70_4
Customer's relational behaviour	S_RelBehavior_80	S_RelBehavior_80_1
		S_RelBehavior_80_2
		S_RelBehavior_80_3
		S_RelBehavior_80_4
		S_RelBehavior_80_5
		S_RelBehavior_80_6
		S_CollSpecialist_80_7
Profitability	S_Profitability_90	S_Profitability_90_2
		S_Profitability_90_3
		S_Profitability_90_4
		S_Profitability_90_5
		S_Profitability_90_6
Forecast and planning	O_Forecast	O_Forecast_1
		O_Forecast_2
		O_Forecast_3

		O_Forecast_4
Ordering process	O_Ordering	O_Ordering_1
		O_Ordering_2
		O_Ordering_3
		O_Ordering_4
Payment	O_Payment	O_Payment_1
		O_Payment_2
		O_Payment_3
Quality of processes	O_QualityPro	O_QualityPro_1
		O_QualityPro_2
		O_QualityPro_3
		O_QualityPro_4
		O_QualityPro_5
Status	ADD_Status_156_1	ADD_Status_156_2
		ADD_Status_156_3
		ADD_Status_156_4
		ADD_Status_156_5
Trust	SC_rel	SC_rel_1
		SC_rel_2
		SC_rel_3
		SC_rel_11

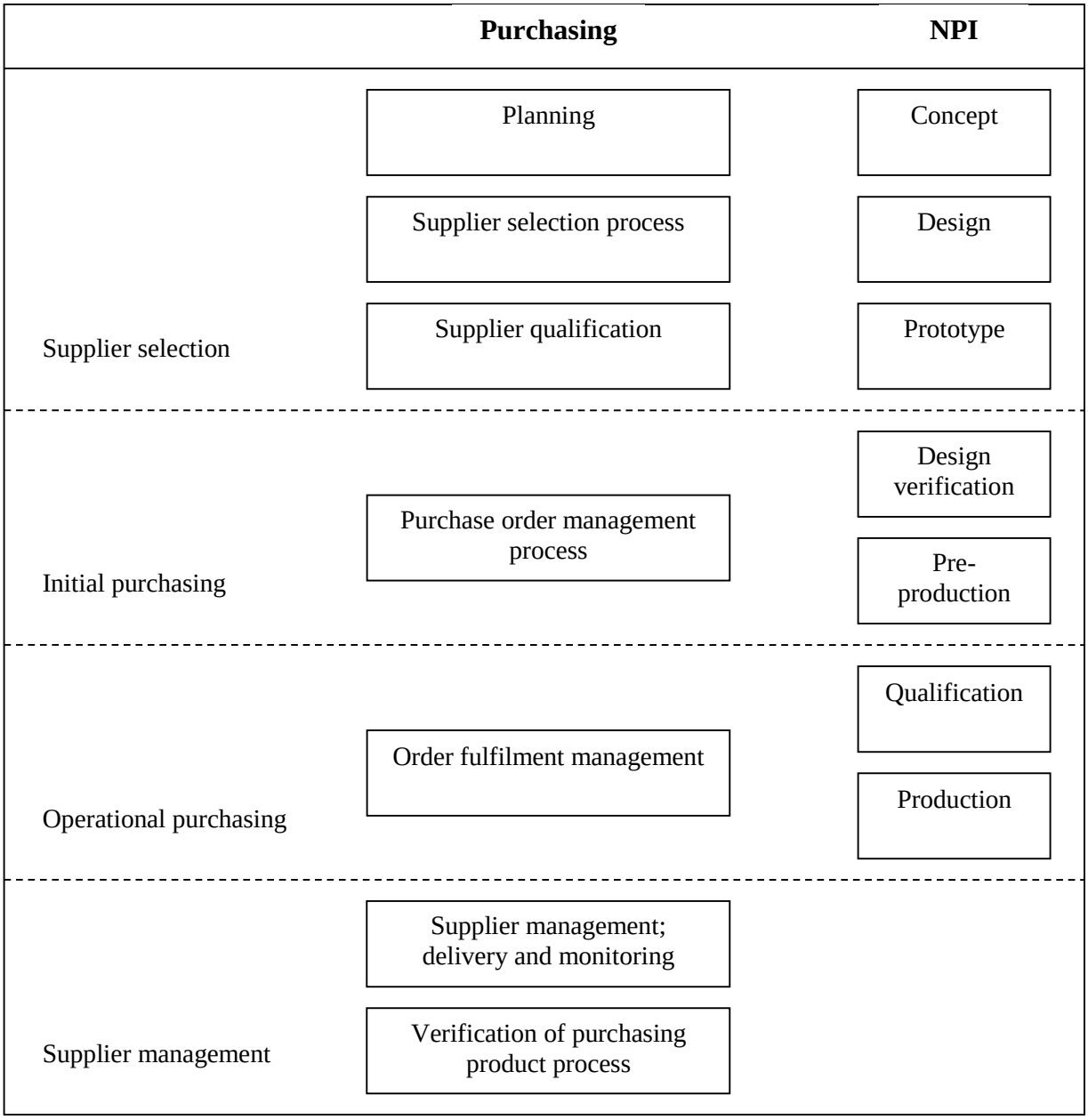
T

Commitment	SC_rel	SC_rel_4
		SC_rel_5
		SC_rel_6
Reciprocity	SC_rel	SC_rel_7
		SC_rel_8
		SC_rel_9
		SC_rel_10
Norms	SC_cog	SC_cog_1
		SC_cog_2
		SC_cog_3
		SC_cog_9
		SC_cog_8
		SC_cog_5
Quantity of interaction	SC_str	SC_str_6
		SC_str_7
		SC_str_8
		SC_str_13
		SC_str_14
		SC_str_2
		SC_str_3
Information sharing	S_I_sharing	S_I_sharing_1

		S_I_sharing_2
		S_I_sharing_3
		S_I_sharing_4
Information quality	S_I_infq	S_I_infq_1
		S_I_infq_2
		S_I_infq_3
		S_I_infq_4
		S_I_infq_5

D. Process the case company

Figure 8: purchasing and NPI process



E. Mann-Whitney U test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Contact accessibility: There is a contact person within Benchmark Electronics Almelo who... - ... coordinates the relevant relationship activities within and outside of Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,969	Retain the null hypothesis.
2	The distribution of Contact accessibility: There is a contact person within Benchmark Electronics Almelo who... - ... is, for the employees of our company, the one to contact in regard to partner-specific questions. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,875	Retain the null hypothesis.
3	The distribution of Contact accessibility: There is a contact person within Benchmark Electronics Almelo who... - ... informs employees within Benchmark Almelo about the needs of our company. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,263	Retain the null hypothesis.
4	The distribution of Growth potential for your company: The relationship with Benchmark Electronics Almelo... - ... provides us with a dominant market position in our sales area. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,809	Retain the null hypothesis.
5	The distribution of Growth potential for your company: The relationship with Benchmark Electronics Almelo... - ... is very important for us with respect to growth rates. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,643	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
6	The distribution of Growth potential for your company: The relationship with Benchmark Electronics Almelo... - ... enables us to attract other customers. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,961	Retain the null hypothesis.
7	The distribution of Growth potential for your company: The relationship with Benchmark Electronics Almelo... - ... enables us to exploit new market opportunities. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,609	Retain the null hypothesis.
8	The distribution of Innovation potential - In collaborating with Benchmark Almelo, our firm developed a very high number of new products/services. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,642	Retain the null hypothesis.
9	The distribution of Innovation potential - In collaborating with Benchmark Almelo, our firm was able to bring to market a very high number of new products/services. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,819	Retain the null hypothesis.
10	The distribution of Innovation potential - The speed with which new products/services are developed and brought to market with Benchmark Almelo is very high. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,929	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
11	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... has always exact and in time forecasts about future demand. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,524	Retain the null hypothesis.
12	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... provides us with forecasts our firm can rely and plan on. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,583	Retain the null hypothesis.
13	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... has for our firm simple and transparent internal processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,412	Retain the null hypothesis.
14	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... supports short decision-making processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,951	Retain the null hypothesis.
15	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... stands open for process optimizations. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,821	Retain the null hypothesis.
16	The distribution of Customer's operative excellence: Benchmark Electronics Almelo... - ... has an optimal payment habit. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,178	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Z

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
17	The distribution of Customer's reliability: In working with our company, Benchmark Electronics Almelo... - ... provided a completely truthful picture when negotiating. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,829	Retain the null hypothesis.
18	The distribution of Customer's reliability: In working with our company, Benchmark Electronics Almelo... - ... always negotiated from a good faith bargaining perspective. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,936	Retain the null hypothesis.
19	The distribution of Customer's reliability: In working with our company, Benchmark Electronics Almelo... - ... never breached formal or informal agreements to benefit themselves. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,283	Retain the null hypothesis.
20	The distribution of Customer's reliability: In working with our company, Benchmark Electronics Almelo... - ... never altered facts in order to meet its own goals and objectives. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,535	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
21	The distribution of Support: Benchmark Electronics Almelo... - ... collaborates with us to improve our manufacturing processes or services. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,258	Retain the null hypothesis.
22	The distribution of Support: Benchmark Electronics Almelo... - ... gives us (technological) advice (e.g. on materials, software, way of working). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,403	Retain the null hypothesis.
23	The distribution of Support: Benchmark Electronics Almelo... - ... gives us quality related advice (e.g. on the use of inspection equipment, quality assurance procedures, service evaluation). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,149	Retain the null hypothesis.
24	The distribution of Involvement: - We are early involved in the new product/service development process of Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,281	Retain the null hypothesis.
25	The distribution of Involvement: - We are very active in the new product development process of Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,239	Retain the null hypothesis.
26	The distribution of Involvement: - Communication with our firm about quality considerations and design changes is very close. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,801	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
27	The distribution of Customer's relational behavior - Problems that arise in the course of the relationship are treated by Benchmark Almelo as joint rather than individual responsibilities. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,659	Retain the null hypothesis.
28	The distribution of Customer's relational behavior - Benchmark Almelo is committed to improvements that may benefit our relationship as a whole and not only themselves. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,880	Retain the null hypothesis.
29	The distribution of Customer's relational behavior - We each benefit and earn in proportion to the efforts we put in. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,300	Retain the null hypothesis.
30	The distribution of Customer's relational behavior - Our firm usually gets at least a fair share of the rewards and cost savings from our relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,161	Retain the null hypothesis.
31	The distribution of Customer's relational behavior - Benchmark Almelo would willingly make adjustments to help us out if special problems/needs arise. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,410	Retain the null hypothesis.
32	The distribution of Customer's relational behavior - Benchmark Almelo is flexible when dealing with our firm. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,093	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
33	The distribution of Customer's relational behavior - The collaboration with Benchmark Almelo's operational/specialist department is very good. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,391	Retain the null hypothesis.
34	The distribution of Economic performance / Profitability: The relationship with Benchmark Electronics Almelo... - ... provides us with large sales volumes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,192	Retain the null hypothesis.
35	The distribution of Economic performance / Profitability: The relationship with Benchmark Electronics Almelo... - ... helps us to achieve good profits. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,418	Retain the null hypothesis.
36	The distribution of Economic performance / Profitability: The relationship with Benchmark Electronics Almelo... - ... allows us to gain high margins. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,966	Retain the null hypothesis.
37	The distribution of Economic performance / Profitability: The relationship with Benchmark Electronics Almelo... - ... has a positive influence on the profitability of our firm. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,437	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

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Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
38	The distribution of Economic performance / Profitability: The relationship with Benchmark Electronics Almelo... - ... enables us to raise our profitability together. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,352	Retain the null hypothesis.
39	The distribution of Customer Satisfaction - Our firm is very satisfied with the overall relationship to Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,351	Retain the null hypothesis.
40	The distribution of Customer Satisfaction - On the whole, our firm is completely happy with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,616	Retain the null hypothesis.
41	The distribution of Customer Satisfaction - Generally, our firm is very pleased to have Benchmark Almelo as our business partner. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,412	Retain the null hypothesis.
42	The distribution of Customer Satisfaction - If we had to do it all over again, we would still choose to use Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,850	Retain the null hypothesis.
43	The distribution of Customer Satisfaction - Our firm does not regret the decision to do business with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,657	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
44	The distribution of Customer Satisfaction - Our firm is satisfied with the value we obtain from the relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,236	Retain the null hypothesis.
45	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... contact accessibility. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,680	Retain the null hypothesis.
46	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... growth potential for your company. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,549	Retain the null hypothesis.
47	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... innovation potential. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,869	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
48	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... customer's operative excellence. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,683	Retain the null hypothesis.
49	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... customer's reliability. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,924	Retain the null hypothesis.
50	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... support. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,974	Retain the null hypothesis.
51	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... involvement. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,991	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... customer's relational behaviour. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,631	Retain the null hypothesis.
53	The distribution of If you compare Benchmark Electronics Almelo to your (next) best customer according to each category, how would you compare it? Benchmark Almelo is performing better on... - ... economic performance / Profitability. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,631	Retain the null hypothesis.
54	The distribution of Forecast and planning: Benchmark Electronics Almelo... - ... has exact and timely forecasts about future demand. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,274	Retain the null hypothesis.
55	The distribution of Forecast and planning: Benchmark Electronics Almelo... - ... provides us with forecasts our firm can rely and plan on. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,808	Retain the null hypothesis.
56	The distribution of Forecast and planning: Benchmark Electronics Almelo... - ... has good time schedule for its orders (no unexpected rush orders). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,404	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
57	The distribution of Forecast and planning: Benchmark Electronics Almelo... - ... adheres to agreements without later changes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,394	Retain the null hypothesis.
58	The distribution of Ordering process: Benchmark Electronics Almelo has... - ... no special packaging and delivery requirements. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,621	Retain the null hypothesis.
59	The distribution of Ordering process: Benchmark Electronics Almelo has... - ... good support for first-time deliveries. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,121	Retain the null hypothesis.
60	The distribution of Ordering process: Benchmark Electronics Almelo has... - ... acceptable and well communicated delivery deadlines. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,459	Retain the null hypothesis.
61	The distribution of Ordering process: Benchmark Electronics Almelo has... - .... well-functioning and uncomplicated receiving procedures (inspections). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,633	Retain the null hypothesis.
62	The distribution of Payment: Benchmark Electronic Almelo has... - ... reliable payment habits. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,422	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
63	The distribution of Payment: Benchmark Electronic Almelo has... - ... quick and unproblematic payment. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,296	Retain the null hypothesis.
64	The distribution of Payment: Benchmark Electronic Almelo has... - ... little interaction need to settle payment. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,275	Retain the null hypothesis.
65	The distribution of Quality of processes: Benchmark Electronic Almelo... - ... has for our firm simple and transparent internal processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,854	Retain the null hypothesis.
66	The distribution of Quality of processes: Benchmark Electronic Almelo... - ... has sophisticated IT systems. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,645	Retain the null hypothesis.
67	The distribution of Quality of processes: Benchmark Electronic Almelo... - ... supports short decision making processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,408	Retain the null hypothesis.
68	The distribution of Quality of processes: Benchmark Electronic Almelo... - ... has uncomplicated and transparent processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,263	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
69	The distribution of Quality of processes: Benchmark Electronic Almelo... - ... has state-of-the-art support systems and modern processes. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,810	Retain the null hypothesis.
70	The distribution of Preferred Customer Status: Compared to other customers in our firm´s customer base... - ... Benchmark Almelo is our preferred customer. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,630	Retain the null hypothesis.
71	The distribution of Preferred Customer Status: Compared to other customers in our firm´s customer base... - ... we care more for Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,809	Retain the null hypothesis.
72	The distribution of Preferred Customer Status: Compared to other customers in our firm´s customer base... - ... Benchmark Almelo receives preferential treatment. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,498	Retain the null hypothesis.
73	The distribution of Preferred Customer Status: Compared to other customers in our firm´s customer base... - ... we go out on a limb for Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,895	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
74	The distribution of Preferred Customer Status: Compared to other customers in our firm´s customer base... - ... our firm's employees prefer collaborating with Benchmark Almelo to collaborating with other customers. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,039	Reject the null hypothesis.
75	The distribution of Preferential treatment: Our firm... - ... allocates our best employees (e.g. most experienced, trained, intelligent) to the relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,613	Retain the null hypothesis.
76	The distribution of Preferential treatment: Our firm... - ... allocates more financial resources (e.g. capital, cash) to the relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,847	Retain the null hypothesis.
77	The distribution of Preferential treatment: Our firm... - ... grants Benchmark Almelo the best utilization of our physical resources (e.g. equipment capacity, scarce materials). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,825	Retain the null hypothesis.
78	The distribution of Preferential treatment: Our firm... - ... shares more of our capabilities (e.g. skills, know-how, expertise) with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,394	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
79	The distribution of Customer attractivenes: These questions are about the expectations you have of the relationship with Benchmark Electronics Almelo. - We consider Benchmark Almelo to be an attractive partner for future collaborations. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,438	Retain the null hypothesis.
80	The distribution of Customer attractivenes: These questions are about the expectations you have of the relationship with Benchmark Electronics Almelo. - We expect positive outcomes from the relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,671	Retain the null hypothesis.
81	The distribution of Customer attractivenes: These questions are about the expectations you have of the relationship with Benchmark Electronics Almelo. - Our firm has positive expectations about the value of the relationship with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,730	Retain the null hypothesis.
82	The distribution of Status: According to us ... - ... Benchmark Almelo has a high-status. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,995	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
83	The distribution of Status: According to us ... - ... Benchmark Almelo is admired by others. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,220	Retain the null hypothesis.
84	The distribution of Status: According to us ... - ... Benchmark Almelo has a high prestige. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,486	Retain the null hypothesis.
85	The distribution of Status: According to us ... - ... Benchmark Almelo is highly regarded by others. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,640	Retain the null hypothesis.
86	The distribution of Trust: Our firm and Benchmark Electronics Almelo... - ... consider own interests as well as others. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,929	Retain the null hypothesis.
87	The distribution of Trust: Our firm and Benchmark Electronics Almelo... - ... trust in each other to keep the best interest in mind. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,733	Retain the null hypothesis.
88	The distribution of Trust: Our firm and Benchmark Electronics Almelo... - ... count on each other to follow through with promises. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,996	Retain the null hypothesis.
89	The distribution of Trust: Our firm and Benchmark Electronics Almelo... - ... have mutual trust between us. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,944	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
90	The distribution of Commitment: Our firm and Benchmark Electronics Almelo... - ... find it pleasant to work with each other. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,580	Retain the null hypothesis.
91	The distribution of Commitment: Our firm and Benchmark Electronics Almelo... - ... want to remain in the relationship. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,379	Retain the null hypothesis.
92	The distribution of Commitment: Our firm and Benchmark Electronics Almelo... - ... are attracted by what the other party represents as a firm (image, brand, reference etc.). is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,268	Retain the null hypothesis.
93	The distribution of Reciprocity: Your firm and Benchmark Electronics Almelo... - ... consider the relationship as mutually beneficial. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,379	Retain the null hypothesis.
94	The distribution of Reciprocity: Your firm and Benchmark Electronics Almelo... - ... feel indebted because of what the other does for each other. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,318	Retain the null hypothesis.
95	The distribution of Reciprocity: Your firm and Benchmark Electronics Almelo... - ... expect to also work on further project in the future. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,607	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
96	The distribution of Reciprocity: Your firm and Benchmark Electronics Almelo... - ... have mutual respect between parties. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,450	Retain the null hypothesis.
97	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... frequently communicate with each other. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,215	Retain the null hypothesis.
98	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... frequently communicate at different levels. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,428	Retain the null hypothesis.
99	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... frequently communicate between different functions. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,614	Retain the null hypothesis.
100	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... have a close personal interaction between the parties. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,861	Retain the null hypothesis.
101	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... have a personal friendship between the parties. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,697	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... have common project reviews. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,525	Retain the null hypothesis.
103	The distribution of Quantity of interaction: Our firm and Benchmark Electronics Almelo... - ... use internal linking systems. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,798	Retain the null hypothesis.
104	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... interpret situations in the same way / have the same approaches to business dealings. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,214	Retain the null hypothesis.
105	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... have a common understanding about what is allowed / not allowed. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,376	Retain the null hypothesis.
106	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... have the same vision of business in the relationship. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,265	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

QQ

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
107	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... have a similar corporate culture / values and management style. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,632	Retain the null hypothesis.
108	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... have compatible goals / similar targets. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,672	Retain the null hypothesis.
109	The distribution of Cognitive shared norms and values: Our firm and Benchmark Electronics Almelo... - ... are aware of each other's objectives / KPIs. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,621	Retain the null hypothesis.
110	The distribution of Information sharing - general. - Our firm shares proprietary information with Benchmark Almelo. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,765	Retain the null hypothesis.
111	The distribution of Information sharing - general. - We inform this customer in advance of changing needs of our company. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,264	Retain the null hypothesis.
112	The distribution of Information sharing - general. - We share business knowledge of core business processes with Benchmark. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,841	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
113	The distribution of Information sharing - general. - We share potentially critical new information with this customer early on. is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,466	Retain the null hypothesis.
114	The distribution of Information quality: To what extent is the information that is shared between your firm and Benchmark Almelo meeting your requirements being... - ... timely enough? is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,228	Retain the null hypothesis.
115	The distribution of Information quality: To what extent is the information that is shared between your firm and Benchmark Almelo meeting your requirements being... - ... accurate enough? is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,552	Retain the null hypothesis.
116	The distribution of Information quality: To what extent is the information that is shared between your firm and Benchmark Almelo meeting your requirements being... - ... complete enough? is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,947	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
117	The distribution of Information quality: To what extent is the information that is shared between your firm and Benchmark Almelo meeting your requirements being... - ... adequate enough? is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,383	Retain the null hypothesis.
118	The distribution of Information quality: To what extent is the information that is shared between your firm and Benchmark Almelo meeting your requirements being... - ... reliable enough? is the same across categories of group Mann-Whitney U test.	Independent-Samples Kruskal-Wallis Test	,538	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

F. Factor analysis

Factor analysis – after deletion

	Values 'IS' and 'ESI'						Values 'PC'			
	1	2	3	4	5	6	1	2	3	4
Trust: SC_Rel_1	0,404	0,760	0,092	0,166	0,041	0,138				
Trust: SC_Rel_2	0,415	0,842	0,211	0,161	-0,020	0,135				
Trust: SC_Rel_3	0,233	0,792	0,452	0,006	0,244	-0,007				
Trust:SC_Rel_11	0,361	0,760	0,404	0,088	0,056	0,041				
Commitment: SC_Rel_4	0,229	0,452	0,717	0,273	-0,104	0,117				
Commitment: SC_Rel_5	0,134	0,227	0,913	0,139	0,109	0,108				
Commitment: SC_Rel_6	0,320	0,350	0,574	-0,091	0,107	0,320				
Shard norms: SC_Cog_1	0,830	0,256	0,208	0,057	0,071	0,161				
Shard norms: SC_Cog_2	0,808	0,258	0,141	0,234	0,127	-0,010				
Shard norms: SC_Cog_3	0,784	0,331	0,132	0,256	0,142	0,008				
Shard norms: SC_Cog_8	0,542	0,230	0,289	-0,039	0,400	-0,049				
Shard norms: SC_Cog_5	0,710	0,251	0,141	-0,083	0,221	0,264				
Reciprocity: SC_rel_8	0,116	0,115	0,187	0,072	0,106	0,842				
Inf. sharing: S_I_sharing_1	0,188	0,040	-0,034	0,025	0,711	0,103	-0,133	0,082	0,509	0,463
Inf. sharing: S_I_sharing_3	0,265	0,042	0,123	0,054	0,889	0,028	0,003	0,341	0,126	0,922
S_Involvement_70_1	0,212	0,184	0,030	0,917	0,011	-0,055				
S_Involvement_70_2	0,103	0,048	-0,002	0,829	-0,131	0,125				
S_Involvement_70_3	-0,011	0,028	0,170	0,636	0,201	-0,003				
PC_PC_110_2							0,386	0,802	0,190	0,152
PC_PC_110_3							0,291	0,843	0,177	0,154
PC_PC_110_4							0,050	0,851	0,252	0,179
PC_PC_110_5							0,067	0,636	0,493	0,121
PC_PC_110_6							0,350	0,651	0,138	0,069
PC_Attractiveness_126_1							0,355	0,491	0,664	0,111
PC_Attractiveness_126_2							0,442	0,367	0,751	0,066
PC_Attractiveness_126_3							0,466	0,440	0,606	0,161
S_Satisfaction_100_1							0,884	0,277	0,113	-0,005
S_Satisfaction_100_2							0,930	0,131	-0,072	0,132
S_Satisfaction_100_3							0,770	0,081	0,219	-0,178
S_Satisfaction_100_5							0,588	0,265	0,408	0,066
S_Satisfaction_100_6							0,684	0,213	0,496	0,037

G. Discriminant validity (HTMT)

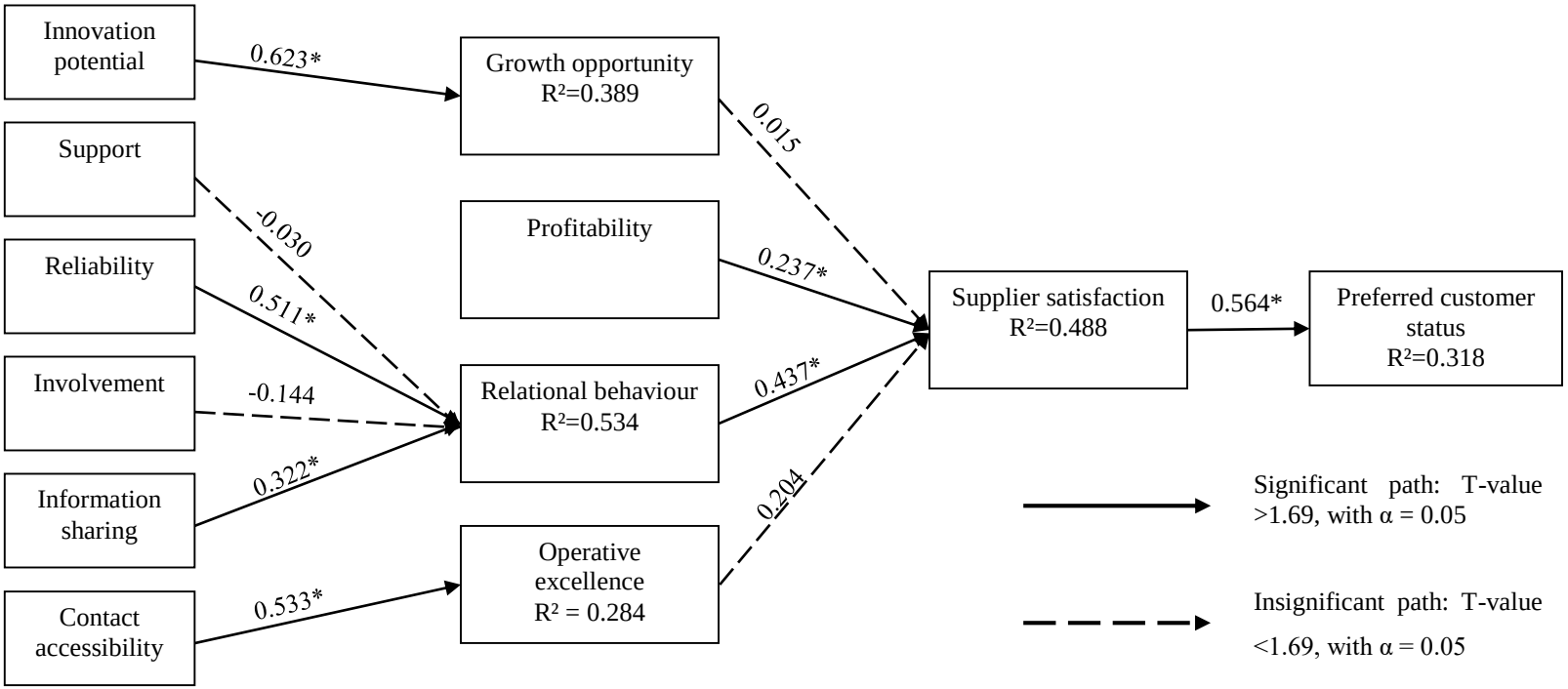
HTMT For the model ‘hypotheses regarding preferred customer status’

	customer attractiveness	information sharing	preferred customer	supplier satisfaction
customer attractiveness				
information sharing	0,504			
preferred customer	0,770	0,527		
supplier satisfaction	0,693	0,184	0,552	

HTMT For the model ‘hypotheses regarding information sharing and early supplier involvement ’

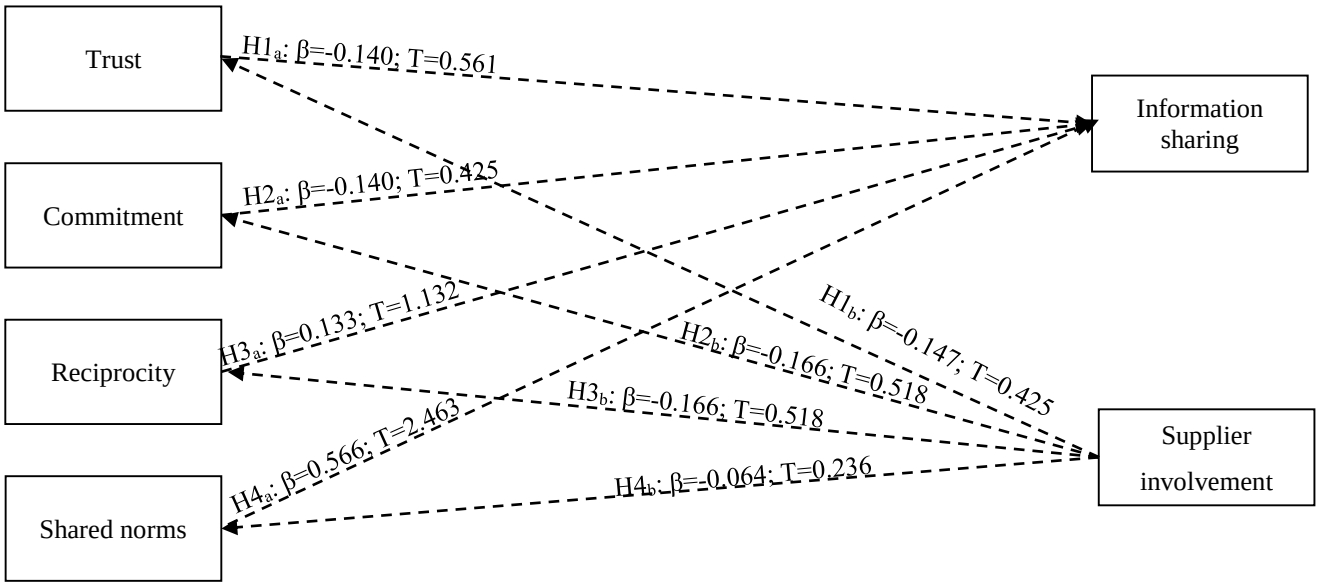
	Information sharing	Trust	commitment	involvement	reciprocity	shared norms
Information sharing						
Trust	0,271					
commitment	0,262	0,763				
involvement	0,180	0,290	0,270			
reciprocity	0,252	0,273	0,401	0,083		
shared norms	0,574	0,711	0,569	0,241	0,293	

H. Replication model Vos et al. (2016)



I. Results reversed hypotheses early supplier involvement

Hyp.	Path			Coefficient beta	T-value
H_{1A}	Trust	→	Information sharing	-0,141	0,513
H_{1b}	Trust	←	Supplier involvement	-0,284	0,050
H_{2a}	Commitment	→	Information sharing	-0,063	0,419
H_{2b}	Commitment	←	Supplier involvement	-0,274	0,049
H_{3a}	Reciprocity	→	Information sharing	0,133	0.148
H_{3b}	Reciprocity	←	Supplier involvement	-0.055	0,350
H_{4a}	Shared norms	→	Information sharing	0,566	0.011
H_{4b}	Shared norms	←	Supplier involvement	-0,222	0,154



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