Capturing supplier knowledge in new product development: The effects of trust

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Abstract

Trust has been found to be important for integrating suppliers’ knowledge in new product development (NPD). Different degrees of trust have different consequences for NPD. This paper investigates the effects of trust for capturing supplier knowledge in NPD in different situations. Two different NPD collaborations, identified as polar cases, are studied. The findings indicate differences in knowledge integration practices related to time scope and depth of the collaboration as a consequence of different types of trust. There are two main contributions from these findings. First, different types of trust are emphasized in different types of supplier collaborations. Second, the type of trust is associated with differences in knowledge integration practices expressed in time scope and depth of the collaboration. Relational trust creates conditions for joint knowledge integration in interactive and joint processes, whereas competence-based trust is associated with accessing and capturing knowledge.

Key words: trust, knowledge integration, supplier collaboration, new product development

1. Introduction

Ever since Japanese supplier relationships have become the role model for successful supplier involvement in product development (Clark, 1989), trust has been considered as an important success factor for buyer-supplier relationships. Japanese supplier relationships rely to a higher degree on trust and are characterized by the mutual investments of the supplier and buyer, the establishment of clear norms, and the creation of a reputation (Smitka, 1991). The importance of trust has also been confirmed outside the Japanese context (Dyer & Chu, 2003; LaBahn & Krapfel, 2000; Ragatz, Handfield, & Scannell, 1997; Sako & Helper, 1998; Walter, 2003).

Trust has also been found important for integrating suppliers’ knowledge in new product development (NPD) (e.g. Ha et al., 2009; Lincoln et al., 1998; Squire et al., 2009) and serves as an important catalyst for collaborative innovation (Fawcett et al., 2012). Thus, trust and the integration of knowledge are crucial for the competitiveness and the survival of the firm (Grant, 1996; Grant and Baden-Fuller, 2004). Increased levels of knowledge sharing between buyers and suppliers can help improve products and processes, decision making, and problem resolution at early stages of product development by taking advantage of suppliers’ technical expertise (Cousins et al., 2011). Therefore, as the parties increase the frequency, quality, and timing of knowledge sharing, the effectiveness of the buyer’s product development processes are likely to increase (Cousins et al., 2011). Nonetheless, while there is a fair amount of literature on work integration in product development, less attention has been focused on knowledge integration or sharing (Hong et al., 2004).

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Meanwhile, how knowledge is transferred between buyers and suppliers remains an important empirical question, particularly as inter-organizational product development requires more extensive coordination than within-firm product development, while also generating the need for developing trust with the partner company (Cousins et al., 2011). With trust, it is more likely that the parties share information they otherwise would consider sensitive (Selnes and Sallis, 2003). While an adequate level of trust in the other party seems necessary for knowledge transfer to happen, how trust affects the transfer of knowledge between partners is still not fully understood (Becerra et al., 2008). The issue of what type of trust affects firm-level outcomes, in particular, has remained elusive (Sengun, 2010). According to Bhandar et al. (2006), the role of trust within new product development (NPD) collaborations is contingent upon the specific situation. The authors analyze the role of social capital and find support for the concept of “task contingency”, which indicates that appropriation of the value of social capital - including trust - depends on the goal of a task. Thus, trust, or confidence in another’s goodwill (Ring & Van de Ven, 1992), is a situational entity. Gambetta (1988) defines trust as a subjective probability with which an actor assesses that another actor will perform a particular action. Different types of trust - such as norms that create predictability and trustworthiness or a calculative form based on interests - are emphasized in different situations (Adler, 2001). Consequently, the integration of suppliers’ knowledge in NPD can be based on different types of trust. Nonetheless, this is highly neglected in the literature where trust is mainly considered as an important factor moderating the relationship (Lai et al., 2011; Wang et al., 2011; Zhang et al., 2011). It seems that the general recommendation is formulated as “the more trust the better”. The focus on trust, in isolation of other factors, neglects to take into account the more complex picture of different types of trust that are necessary in different types of collaborations. Differences in scope and depth of supplier relationships are expected to be expressed in different types of trust. This paper explicitly investigates the effects of trust for capturing supplier knowledge in NPD in different situations.

The paper is structured as follows: First a theoretical framework related to the subject of knowledge integration and trust in NPD is provided. Thereafter, the chosen methodology for the study is presented. The paper proceeds with a presentation of the findings which is followed by an analysis of the data. Finally, there is a conclusion where managerial implications and suggestions for further research are presented.

2. Theoretical framework

The most relevant theoretical concepts in this study are knowledge integration and trust. A short overview of the literature is provided below.

2.1 Knowledge integration in NPD

Knowledge, or merely the integration of knowledge, is a key to competitiveness and survival of the firm (Grant, 1996). Grant (1996) argues that the efficiency, the scope, and the flexibility of integration are the main aspects to this competitiveness. The efficiency of integration has to do with the extent to which the firm accesses and utilizes the specialist knowledge. Grant (1996) focuses on minimizing communication for efficient integration. The scope of integration has to do with the breadth of the specialized knowledge the firm draws upon. The flexibility of integration is the extent to which a firm can access additional knowledge and reconfigure existent knowledge. The emphasis according to Grant (1996), though, is efficiency. As it is not likely that all necessary knowledge resides in one single
firm, knowledge is foremost a resource that can be accessed and captured through external collaborations using efficient mechanisms (Grant and Baden-Fuller, 2004).

However, according to Okhuysen and Eisenhardt (2002), knowledge integration is a process, where individuals collaborate, share, and combine specialised knowledge to generate new knowledge. This process perspective is also acknowledged by Tiwana and McLean (2005), who also argue that integration of knowledge differs from sharing and transfer of knowledge. Knowledge transfer refers to the transmission of knowledge from one individual to another. Knowledge sharing is a narrower concept that involves revealing the presence of pertinent knowledge without necessarily transmitting it entirely. Knowledge integration, on the other hand, involves and builds on sharing, but goes beyond it (Okhuysen and Eisenhardt, 2002). It is also about combining, extending, and reconfiguring existent knowledge. Thus, knowledge integration is not simply a matter of assembling discrete pieces of knowledge, as Lego blocks, as the “knowledge as a resource” view implies. Rather knowledge integration depends on how members know and integrate their individual knowledge, where the outcome “consists of both the shared knowledge of individuals and the combined knowledge that emerges from their interaction” (Okhuysen and Eisenhardt, 2002: 384). In the context of NPD, this outcome is not just about sharing and combining, but also about creation and application in the form of a new product (Huang and Newell, 2003; Nonaka 1994; Nonaka and Takeuchi, 1995; Alawi and Tiwana, 2002). Knowledge creation is the development of new knowledge through the conversation and interaction between tacit and explicit knowledge in an organization (Nonaka, 1994; Nonaka and Takeuchi, 1995). Knowledge application is the value creating activity when existing knowledge is brought to bear fruit on the problem at hand, i.e., when knowledge is distributed throughout the organization and transferred and applied where it is needed (Alawi and Tiwana, 2002).

Antecedents for this integration are related to the heterogeneity of expertise, the quality of the relationships, and the ability to interrelate with peers outside their own domain (Tiwana and McLean, 2005). Past experience of collaborating with external parties influences integration (Huang and Newell, 2003). An adequate organizational structure and practice may promote or oppose the social capital and common understanding needed for the knowledge integration processes (Ibid). When sensitive strategic knowledge is being shared, communication is critical, requiring deeper and more connected relationships (Hammerwoll, 2012). Thus, trust is essential, not just within the organization, but also in inter-organizational collaborations. In these situations, well-formulated contracts can complement, but not exclude trust (Blomqvist et al., 2005). Lawson et al. (2009) argue that a lack of trust can be minimized by social mechanisms such as intra-team meetings, joint workshops etc. These interactions may lead to mutual trust which results in information and knowledge exchange between the organizational borders (Ibid). But what do we actually mean by trust in this context?

2.2 Trust
Trust can be defined as confidence in another’s goodwill (Ring & Van de Ven, 1992). This is a quite narrow definition. Gambetta (1988) defines it as the subjective probability with which an actor assesses that another actor will perform a particular action, both before the primary actor can monitor such an action and in a context in which it affects her or his actions. Trust has been shown to lead to greater knowledge exchange in the prior literature (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998; Dyer and Nobeoka, 2000; Adler and Kwon, 2002; Inkpen and Tsang, 2005) and has been found to be a critical factor in inter-organizational learning (Hansen, 1999). Trust facilitates information sharing and learning because it creates a belief between parties that information sharing increases not only the size of the pie but also their share of the pie (Selnes and Sallis, 2003).
Even though there are many studies that confirm trust has a positive impact for knowledge integration (Ha et al., 2009; Lincoln et al., 1998; Squire et al., 2009), few have considered the situational aspect of trust and its consequences for knowledge integration. Different types of trust are expected to be emphasized depending on the scope and depth of the collaboration. In this study, we distinguish between a basic level of trust — based on competence, limited exposure, technological interfaces, and calculation — and a profound level of trust — based on, goodwill, interactive processes, interpersonal contacts and trustworthy individuals (Adler, 2001; Sako, 1992; Noteboom, 2003). A basic distinction between the two trust types concerns the sort of information needed to grant trust. While it is possible to screen for competent behavior by referring to market reputation, goodwill trust is more contextual/particularistic and is verifiable only through mutual engagement.

According to Sengun (2010), trust based on goodwill should increase chances of effective inter-organizational learning by delivering a higher level of involvement and open commitment by the knowledge seeker and a reduction of the risk of exploitation. While Luo (2006) expects competence trust to facilitate both the extent and the efficiency of inter-organizational learning by allowing the recipient to recognize and value the new knowledge provided by another party, Sengun (2010) argues that the role of trust based on competence trust on inter-firm learning will be quite different as competence trust does not have anything to do with the open commitment, extended effort and involvement necessary for effective learning. Her results suggest a positive and significant association between trust based on goodwill and inter-firm learning, while no association was found between trust based on competence and the latter, pointing out that trust per se is no guarantee for fostering inter-firm learning and that it is the type of trust that matters.

3. Methodology

This part describes the methodological choices and their consequences. Starting by describing the choice of a research design, the chapter continues by describing the data collection, data analysis, ending up by discussing the qualitative criteria and the practical steps.

3.1 Research design

Since the aim was to investigate knowledge integration in its context, i.e., to understand the effects of trust for capturing supplier knowledge in NPD collaborations in different situations, qualitative case studies were carried out.

The sampling criteria for selection of the participating firm included that the focal firm would be a high-tech company that had a relatively high R&D activity. As it was not expected that all necessary knowledge for the NPD process resided within such a company, external collaborations were expected. The assumption was that suppliers would add important knowledge that had to be integrated.

An international first tier supplier in the automotive industry was positive towards allowing access to its supplier-collaborations. In collaboration with this company, a NPD project aimed at developing its next generation disc-break was chosen. This paper is based on case studies of two supplier-collaborations within this NPD project. Case studies were considered as an appropriate research strategy, since the aim was to understand a phenomenon - the effects of trust on knowledge integration between buyers and suppliers - within its context (Yin, 2009). The two cases – the holder collaboration and the caliper collaboration - were chosen as they represent two extremes when it comes to scope and depth of collaboration. At the same time
the products in question are similar casting components. Consequently, the two cases can be seen as polar opposites that can be used for developing theoretical insight (Ibid).

3.2 Data collection
Data was collected through 12 interviews with key informants from the two NPD collaborations: strategic purchasing staff, designers, and manufacturing engineers. In addition we were able to talk to representatives from the suppliers, which provided additional valuable insights. By selecting individuals that had access to the NPD collaboration with different roles and responsibilities in the project, the respondents’ insight representativeness was ensured (Alvesson, 2011). In order to gather data that was as rich as possible, semi-structured interviews were conducted face-to-face. Each interview lasted on average one hour. The interviews were recorded and thereafter transcribed. In addition to the interviews, complementary data was supported by studying project documents. By systematically documenting the interviews and getting feedback from the companies, data analysis was made possible and practical relevance and validity strengthened (Miles and Huberman, 1994).

3.3 Data analysis
As suggested by Yin (2009), case study analysis requires a case description by the researcher. Therefore an elaborated case description of each collaboration was narrated before the actual analysis. These descriptions include data from the interviews as well as data collected from relevant documents. The analysis itself was essentially done by classifying the narratives into content categories in order to structure the data (Miles and Huberman, 1994). As the aim was to understand the role of trust for knowledge integration, the theoretical framework in previous chapter was used for the analytical replication. In this study polar cases were used to improve theoretical insight.

3.4 Qualitative criteria
To assure a high qualitative standard in the study, reliability and validity had to be considered. Yin (2009) suggests that for qualitative reliability researchers need to document the procedures of their case studies and to document as many steps of the procedures as possible. He also recommends setting up a detailed case study protocol and database. This makes the study consistent and reliable. In this study an interview guide was used for the questions and NVivo for the systematic coding and documentation.

Qualitative validity, on the other hand, determines whether the findings are accurate from the researcher, participant, or reader’s perspective (Creswell, 2009). In this study the results were validated by an ongoing checking with the company.

Qualitative generalization, or external validity, can be used for creating a broader theory. Yin (2009) argues that this form of generalization occurs when the researcher studies additional cases and generalize the findings to theory. In this study the goal was to find polar cases that represented two extremes of collaborations. This would improve the theoretical insight of the role of trust for knowledge integration between the buyer and its suppliers.

4. The empirical study – knowledge integration and trust in two supplier collaborations
This chapter describes the international company, the chosen NPD project, and the two supplier-collaborations – the holder and the caliper.
4.1 The international company – the “buying firm”

The international company we focus on in this study aims for innovative technology solutions that improve safety, the environment and vehicle dynamics to the global vehicle industry within specific niches. The vision is to become the global vehicle industry’s first choice as a long term partner. The company is divided into three divisions, where the division in question is the largest both regarding sales (3.1 billion SEK) and employees (2200).

The company strives for long-term relations with its suppliers, which makes the selection process crucial. It is important that the involved parties feel that they gain from the collaboration.

According to the Head of the Purchasing Department, the company also strives for early involvement of the suppliers. In the same way it aims for a better internal integration, not least between the purchasing and the design department.

The general process for starting up a supplier-collaboration can be described as: 1) R&D presents a draft to purchasing. 2) Purchasing sends a request for quotations to a few chosen suppliers. 3) The suppliers come back with price indications and product reviews. 4) There are meetings with the most promising suppliers. 5) The collaboration starts.

4.2 The NPD project

As mentioned earlier, both supplier-collaborations in this study take part in the same NPD project. This project had been running for three years and was in its final phase when this study began. The purpose of the NPD project was to develop a new generation of disc-brakes for heavy vehicles. Essentially the aim was to realize the lightest disc brake on the market, with the same performance and stability as competitors. In this way it is expected that both the payload and the cost-benefit ratio profit from it.

The main challenges were to reduce weight and cost. However, in terms of knowledge integration there were two major challenges according to the Head of Purchasing Department: selection and involvement of suppliers.

The first major challenge was to select credible suppliers, involving them early in the process. The selection process generally started by asking ten different suppliers for offers, ending up with a dual - or in specific cases - a single source. In the subsequent process the company tried to use open books, not least so that the suppliers would be aware that the large-scale production might be placed somewhere else, in countries such as China or India.

Almost all 60 components within the product had to be changed in the NPD project. This fact made it necessary to start up new supplier collaborations. Out of the 29 different suppliers involved, 20 were new. The collaborations chosen for this study represent two of the most important components on the disc brake - the holder and the caliper.

Both supplier collaborations are seen as successful collaborations. Although their function is different, they are similar in terms of complexity and manufacturing technology.

4.2.1 The holder collaboration

In the holder collaboration, the international company has used an existing supplier that was involved from the very beginning of the NPD process. The process was evaluated as positive by both partners:

“When it comes to the holder I feel the collaboration has worked well. We have a supplier that we have worked with for a long time. We both know how each other’s organization works.”

(Designer, Holder)

“It is a customer who is very good to work with. They have chosen to work with us in the long term.” (Representative of the supplier, Holder)
The supplier is a relatively small Danish company focusing on casting. In fact, this supplier was included already when developing the previous disc-brake model. Thus, the supplier had knowledge about the buyer and its processes as the collaboration started. It had experience from its previous collaboration that the international company was able to incorporate into the new disc-brake model:

“We’ve actually managed to learn the lessons (from our previous collaboration). The manufacturing process, for example, has been managed better, reducing the number of steps in the process” (Designer, Holder)

The supplier has knowledge in casting as well as processing. Even if the supplier does not actually do the processing it has knowledge about these processes. This knowledge is useful even though the component is processed within the buying firm. In fact, the supplier contributes to the development of a technological solution with the help of its knowledge. At the same time the two parties have managed to reduce the cost and the weight of the component with help of shared knowledge in processing:

"When it comes to casting we have the knowledge...in this case we have come up with a solution that is unusual together with our partner."

"...Maybe we have succeeded in bringing knowledge from the earlier collaboration. At the same time we tried something new and became motivated. We have been able to use our previous processing knowledge on both sides.” (Representative of the supplier, Holder)

Even though much of the initial communication with the supplier was channeled through the purchasing department, the problem solving is characterized by an interactive process. The communication is through open and interpersonal dialogue, where ideas from the supplier and the buyer become integrated:

"We have been deeply involved in this. Normally we get a drawing that we base our work on. In this case we have been very close working with design, and together we have tried to optimize the component. The customer has been open in its calculations, so we could see the topic, and critical points. There has been a very open dialogue around the development of this particular article, from the outset.” (Representative of the supplier, Holder)

The collaboration continued in all phases of the NPD process focusing on integrating casting and component processing knowledge in order to develop the new component. Even after finishing the NPD project, the component was further developed and optimized together with the supplier.

4.2.2 The caliper collaboration

In the caliper collaboration, the international company involved a new supplier. In fact, the international company first involved a supplier for the prototype that gave technical inputs for improvements. Then the company chose a supplier that is a well-known player in the disc-break sector. The international company needed a competent and capable supplier as the component was critical and there was time pressure. The selected supplier is a relatively large German supplier that has collaborations with competitors of the international company. The involvement was foremost during one particular phase, early in the NPD process:

"This supplier was very good technically and came up with very important input to certain parts and gave suggestions for solutions.” (Senior Designer, Caliper)
In this phase 3D-models were exchanged and reviewed in order to explore the casting possibilities of the component:

“We do proposals in the casting area to the design department. If they can agree to that, then these optimizations come true…”

Especially in the development phase we have to react and give the feedback to our customer. So that we can change, if necessary, a tolerance or design and geometry, so this is integrated later in the FMEA. “(Representative for the supplier, Caliper)

After the design had been chosen, the optimization of the product in terms of weight and cost actually had been done:

“It is probably a fact that the design sets 80 percent of the price…Their (the supplier’s) feedback is therefore very important and has led to geometrical changes…” (Senior Designer, Caliper)

Thus, focus in the caliper collaboration was to get the highest quality within a limited weight and cost, where knowledge in casting was the critical part. Of course the chosen design also had an impact on the processing. However, in this collaboration the supplier did not share processing knowledge with the international company. Instead the machining was done according to agreed specifications.

5. Analysis

As mentioned, the international company considers both collaborations to be successful. From the buyer’s perspective, both suppliers contribute valuable knowledge. The following comparative analysis, however, focuses on differences in the knowledge integration processes related to the level of trust. A summary is found in Table 1.

<table>
<thead>
<tr>
<th>Past experience</th>
<th>Holder collaboration</th>
<th>Caliper collaboration</th>
</tr>
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<tbody>
<tr>
<td>Type of supplier knowledge input in the collaboration</td>
<td>Casting and processing</td>
<td>Casting</td>
</tr>
<tr>
<td>Time scope of collaboration</td>
<td>All phases of the NPD process</td>
<td>Single phase – limited time period</td>
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<tr>
<td>Depth of the collaboration:</td>
<td>Joint knowledge integration in an interactive process:</td>
<td>Capturing knowledge from the suppliers:</td>
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<tr>
<td>“Knowledge sharing”</td>
<td>-Knowledge in processing shared from previous collaboration</td>
<td>-Knowledge combining in casting design</td>
</tr>
<tr>
<td>“Knowledge combining”</td>
<td>-Integrated problem solutions in the whole process</td>
<td>-Knowledge creation with input from the supplier</td>
</tr>
<tr>
<td>“Knowledge creation”</td>
<td>-Knowledge is created in collaboration with the supplier</td>
<td>-Knowledge input applied in the design phase</td>
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<tr>
<td>“Knowledge application”</td>
<td>-Joint knowledge applied in the new product</td>
<td></td>
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<tr>
<td>Shared knowledge</td>
<td>Processing</td>
<td>No</td>
</tr>
<tr>
<td>Trust</td>
<td>Profound: Goodwill, openness, loyalty interpersonal contact, trustworthy individuals</td>
<td>Basic: Competence, reputation, limited exposure, technological interfaces, calculation</td>
</tr>
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</table>

Table 1: A summary of the comparative analysis between the two supplier-collaborations

The first supplier collaboration - the holder collaboration - continued through all phases of the NPD project. Thus, the time scope of the collaboration can be considered as relatively broad.
It can also be considered as relatively deep. As the supplier was featured in the previous disc-brake development project, there was in fact a profound degree of trust from the very beginning of the collaboration. This trust seems to be founded in the relationship by shared norms, trustworthy individuals, and goodwill (Sengun, 2010). It is represented in openness and direct interpersonal contact (Adler, 2001). Thanks to previous collaboration - and the trust it had created - the holder supplier was able to use the experience that the international company was able to incorporate into the new disk-brake model. In addition, the two parties shared knowledge in processing, which made it possible to integrate knowledge differently than in the caliper collaboration. Even though sharing might not be necessary for knowledge integration, Okhuysen and Eisenhardt (2002) and Huang and Newell (2003) emphasize sharing as an essential part of the knowledge integration process. The sharing of common knowledge enhances communication of distributed and specialized knowledge. In this case, the supplier is not actually responsible for the processing. However, it shares knowledge with the international company that improves some of the processing. This fact optimizes the component. In addition the supplier has knowledge in casting design that is combined with the international company’s knowledge in the creation (Nonaka 1994; Nonaka and Takeuchi, 1995) of the new component. Thanks to the collaboration, the applied knowledge (Alawi and Tiwana, 2002; Tiwana and McLean, 2005) forms a lighter component to a lower cost. In this case knowledge integration is an interactive process in all phases of the NPD project (Okhuysen and Eisenhardt, 2002). The focus is on joint knowledge integration where both partners have the possibility to learn from each other.

In the second collaboration - the caliper collaboration – the supplier is involved for a limited time period. The focus is actually in one particular phase in the NPD project. Thus, the collaboration can be considered as relatively narrow. The caliper collaboration can also be considered as relatively shallow, as a basic level of trust is in place. The supplier is selected because of the reputation of its competence (Sengun, 2010). That is, a calculative form of trust is established, based on costs/benefits (Adler, 2001).

The supplier is less dependent and interested in the relationship with the buyer. Thus, the buyer is limiting its exposure to the supplier. This is expressed in the fact that mainly technical interfaces, rather than interpersonal, are used for efficient knowledge access. The exchange of 3-D models in the design phase is possible with the help of technical equipment. In this way knowledge can easily be captured from the supplier and integrated by the buyer itself (Grant, 1996; Grant and Baden-Fuller, 2004). There is some knowledge combining, creating and applying in this phase as well. However, the process within the caliper collaboration is characterized as integrating supplier knowledge - where external knowledge is added to existent knowledge - not as integrating knowledge in collaboration with the supplier.

Thus, knowledge integration, in terms of combining and sharing specialized knowledge (Okhuysen and Eisenhardt, 2002) as well as creating and applying (Tiwana and McLean, 2005; Nonaka 1994; Nonaka and Takeuchi, 1995; Alawi and Tiwana, 2002) is foremost present in the holder collaboration. In the deep and broad collaboration, knowledge integration is a joint process. In this case, the supplier and the buyer actually share knowledge through interpersonal communication and interaction. In the caliper collaboration, however, technical interfaces make it possible to capture knowledge from the supplier.
6. Conclusion

The study shows that sharing, combining, and integrating specialized knowledge require trust. However, our findings also reveal that differences in scope and depth of the collaboration are expressed in different degrees of trust and types of knowledge integration practices. Consequently, the contribution of the study is two-fold. First, we show that different types of trust are emphasized in different types of supplier collaborations. Depending on the depth and scope of the collaboration, a more profound level based on relational trust or basic level related to competence trust is present. Second, this also has consequences for knowledge integration with suppliers. Relational trust creates conditions for joint knowledge integration in an interactive and joint process exemplified by Okhuysen and Eisenhardt (2002). Competence-based trust, on the other hand, is related to knowledge integration processes focusing on capturing knowledge by accessing knowledge from the supplier. This perspective could be connected to the rational economic view on knowledge integration mechanisms proposed by Grant (1996).

The study shows that different degrees of trust promote different types of knowledge integration, either by joint knowledge integration or capturing supplier knowledge by accessing it. Our findings support Das and Teng’s (2001) and Lui and Ngo’s (2004) previous work that it is crucial to identify specific relationships among different trust types and organizational outcomes.

When assessing and selecting a supplier, management has to consider the possible and preferred outcomes of the collaboration; if it is about a strategic alliance, where joint learning is an aim, or if it is a commercial deal for temporary access to knowledge. In the first case, a profound level of trust has to be developed. Focus has to be on interpersonal contacts between trustworthy individuals. In the second case, a basic level of trust is enough. Technological interfaces might be adequate.

As the findings of this study are just based on a dual case study, additional cases - in different companies and industries - are needed for an improved theoretical insight (Yin, 2009). Further research is also needed to test the generalizability, i.e., actual replication of the findings. Future research can help identify the impacts of inter-organizational contextual variables, such as power and dependence across trading partners. Likewise, the architecture and rate of technological development or innovation for the product in question may affect the knowledge integration efforts. For example, according to Squire et al. (2009), product modularization may decrease the knowledge transfer required as interfaces can be fully specified to suppliers. The differences between transfer of tacit versus explicit knowledge via trust (c.f., Becerra et al., 2008) would also be a fruitful avenue for research.

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