Sourcing technology from suppliers in new product development – Purchasing’s role as a trouble shooter

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Abstract

Although the benefits of involving suppliers in new product development (NPD) under technological uncertainty are not unambiguously affirmed, many firms need to involve suppliers under these circumstances anyway as not all technological knowledge resides within the firm. Previous research argues that purchasing fulfils an important role in involving the suppliers in NPD. However, purchasing’s role under technological uncertainty has not been investigated in detail. The purpose of this paper is to explore purchasing’s role in technology selection, supplier selection and level of participation in NPD projects involving technology suppliers. Three NPD projects at one large high-tech firm are studied. It is shown that purchasing had limited influence in the technology selection process. Furthermore, the results show that purchasing fulfils an important role in the supplier selection. More importantly, this paper identifies that purchasing has a role as a trouble-shooter throughout the collaborative NPD projects. Purchasing does not necessarily need to be a member of the project team, and be involved in solving daily, routine problems, but serves as a trouble-shooter to solve major problems related to the supplier’s strategy, the relationship with the supplier and commitment issues.

Keywords: Purchasing, New Product Development, R&D collaborations, Supplier Involvement

1 Introduction

The purchasing function is increasingly lifted forward as an important function contributing to a firm’s long-term performance (Carr and Pearson 2002; Chen et al. 2004; Paulraj et al. 2006). In many firms, purchasing has evolved into a strategic function and is considered as an important resource by top management. In these firms, the purchasing staff contributes with their own expertise and by involving key suppliers into the firm’s planning process (Carr and Pearson 2002). The importance of purchasing stretches also into new product development activities (NPD), especially when suppliers actively participate in these activities. Purchasing has been proposed to play an important role in managing the suppliers and supporting the R&D function (Wynstra, Weggeman and van Weele, 2003). More precisely, purchasing does not necessarily only contribute with cost, quality and deliverability issues (Dowlatshahi 1998), but can also contribute by linking innovation and sourcing strategies through technology road mapping with suppliers, which can form an important basis for supplier selection (Schiele 2010). Consequently, it can be argued that purchasing fulfils an essential role in achieving potential benefits of supplier involvement in NPD, and purchasing’s involvement in technology selection, supplier selection, and participation in NPD has been lifted forward as a best practice (Schiele 2010).

Whether or not the benefits of supplier involvement in NPD also apply for technological uncertain NPD projects is still largely debated (Johnsen 2009). In some studies positive effects are observed, but in other studies no benefits of involving suppliers in technological uncertain NPD projects were found. It has been speculated that unpredictable technology makes it difficult to identify suitable suppliers up-front, and consequently, in order to maintain design flexibility, suppliers may be involved only at the latest stages of product
development or not at all (Eisenhardt and Tabrizi 1995). This makes sense when all technologies reside within one firm and supplier involvement mainly considers manufacturability issues. However, in many complex NPD projects, technology suppliers may be an important complementary source of knowledge (Enkel et al. 2009). Especially, projects with technological uncertainty might require the integration of supplier technologies in NPD. Under these circumstances, supplier involvement may differ considerably from supplier involvement under technological certainty. Previous research points at the importance of integrating these suppliers on the NPD team (Petersen et al. 2003; Ragatz et al. 2002), and to select technical capable suppliers (Wasti and Liker 1997; Wynstra et al. 2010). Despite these valuable insights, the investigation of supplier involvement under technological uncertainty has been identified as a fruitful avenue for research as complementary insights into several different aspects is lacking and different strategies seem to exist for different types of suppliers (Petersen et al. 2003). Although purchasing has been identified as important for managing supplier involvement in NPD projects, its specific role while involving technology suppliers has not been investigated previously.

In order to fill this gap, the purpose of this paper is to explore purchasing’s role in technology selection, supplier selection and level of participation in NPD projects involving technology suppliers. In this paper, purchasing refers to the purchasing department, which in some companies is also referred to as procurement, sourcing or the supply management function at the firm. As the paper is explorative, and aims to capture the complexity of the phenomenon rather than statistical relationships, the study is based on three NPD projects within one single firm. This firm is acting as a systems-integrator of complex products. Each of the projects aims at developing a completely new product building largely on the technology provided by an external supplier. In the studied projects, important technology is provided by the suppliers because the firm does not have the required technology in-house. Thus, the complementary knowledge the suppliers provide is related to the technology and not to the NPD process or the production. We are referring to these suppliers as technology suppliers in order to stress their important complementary knowledge of the technology for the NPD project. However, these suppliers were also meant to produce parts of the final product after finalizing NPD.

Our findings suggest that purchasing’s role in the technology selection may be overvalued in studies performed from a purchasing perspective. In the projects studied, purchasing was not involved in the technology selection for the NPD projects. However, purchasing was involved and fulfilled an important role in the supplier selection. The main finding from this study indicates that purchasing has an important role as a trouble-shooter in collaborative NPD projects. In contrast to predictions in the literature, where purchasing’s well established participation on the project team is lifted forward as a best practice, our studies show that purchasing’s trouble-shooter role is not bounded to being a member of the project team. Indeed, in two of the projects studied, purchasing was not involved continuously in the NPD team. Still, purchasing could step in at crucial events and helped to solve major problems related to the supplier collaboration. However, our third project also shows that purchasing’s role as a trouble-shooter does not prevent purchasing from being a project member. We argue that in contrast to previous roles identified in the literature (see eg Knight and Harland 2005; Oh and Rhee 2010; Wu et al. 2010) where purchasing solves problems that occur in daily operations or solve routine problems, purchasing as a trouble-shooter solves larger problems that are related to the supplier relationship, the supplier’s strategies and commitment issues.

The paper is structured as follows. The following section outlines our theoretical framework for purchasing’s role in NPD. Thereafter, section three describes the methodology and design of the empirical case studies. Section four consists of a description of the three
case studies with a focus on purchasing’s involvement in the NPD collaborations. In section five, an analysis of the cases is provided using the suggested framework. This also provides the conclusions, limitations of this study and future research.

2 Purchasing’s role in NPD

In a traditional view of the purchasing function, purchasing manages inputs, ensures that these are delivered on time, have sufficient quality, and are at an acceptable price. In addition, purchasing searches for new suppliers, assesses and selects these new suppliers, and is responsible for the contact with existing suppliers and negotiates prices. These activities can be translated into a rationalization role, i.e. contributing to the firm’s competitiveness by focusing on production cost, logistics, and prices of sourced products, and a structure role which refers to managing the supplier network and making sure that suitable suppliers are available (Axelsson and Håkansson 1984; Wynstra et al. 2003). When suppliers increasingly become involved in NPD, purchasing gets an additional role as well. From a situation where suppliers can be selected based on the final product design, and mainly by taking into account issues as the costs of supply, quality of the product and delivery performance as important selection criteria, suppliers become involved already during the NPD process and get a possibility to affect the design. If these collaborative NPD projects are managed from a technology and product functionality perspective only, certain lock-in effects can occur. For instance, the choice for a specific technology and the further product design lock the buying firm in to a specific supplier and its technologies (Handfield et al. 1999). This dependency on a specific supplier may not only result in unreasonable high product prices, but also jeopardize availability of supply when something would happen to this supplier. The most suitable supplier in the NPD project is not necessarily the most suitable supplier for production (Schiele 2010). Consequently, supplier involvement in NPD makes initial selection of the supplier a more critical issue. Here, purchasing can fulfill an important role.

Schiele (2010) refers to the dual role of purchasing, adding the innovation-orientation to the traditional a cost-orientation. The innovation-orientation is previously also referred to as purchasing’s developmental role (Axelsson and Håkansson 1984), which concerns aligning internal development activities with development activities at suppliers, including ensuring that the supplier’s technical competencies are exploited, and committing the suppliers’ activities to the NPD project (Wynstra et al. 2003). It seems that firms that view purchasing as strategic are better equipped for performing this developmental role (Atuahene-Gima 1995; Carr and Smeltzer 1999).

The above indicates that purchasing has an important role in NPD. In this paper we make distinction between purchasing’s role in technology selection, supplier selection and purchasing’s participation on the NPD project. Each of these is discussed in more detail below.

2.1 Purchasing’s role in technology selection

Important choices about product technologies can largely limit the pool of available suppliers as knowledge about certain technologies is largely associated with specific suppliers. In fact, technology selection can result in a lock-in situation, as the product only can be sourced from one or a few suppliers (Handfield et al. 1999).

One of the main decisions made during the product definition phase is the selection of component technology that contributes to achieving the level set in the product specifications (Krishnan and Bhattacharya 2002). It is not uncommon that the NPD team is faced with
several technological options. In these cases the NPD team may choose to consider a prospective, yet not fully proven technology, but that is expected to result in a superior level of performance compared to existing, proven technologies (Krishnan and Bhattacharya 2002). When this technology is developed as part of the NPD project, a situation of technology uncertainty is present as the prospective technology is not validated. The knowledge of the technology may not even reside within the firm, but at external suppliers who are an important source of complementary knowledge (Enkel et al. 2009).

Previous research has provided indications that the role of purchasing is suppressed with increasing technological uncertainty (Oh and Rhee 2010), but has not clearly discussed the role of purchasing in technology selection. Schiele (2010) points at purchasing’s role in formulating technology roadmaps with suppliers, an activity not limited to one single NPD project but that stretches over a longer period of time. These roadmaps can be formulated for several technological fields and reflect technological trends, evolution of the supply base, and can be directly linked to supplier selection. As Schiele (2010 p. 146) puts it “The suppliers who have a better fit with the buyer’s technology roadmap are given preference in sourcing decisions.” However, it is not completely clear how purchasing would gain access to suppliers’ technology roadmaps that are currently not within their industry (Ragatz et al. 2002).

2.2 Purchasing’s role in supplier selection

With purchasing’s role stretched into NPD activities, purchasing has an important role in selecting the suppliers that become involved in the NPD project (McDermott and Handfield 2000; McGinnis and Vallopra 1999; Schiele 2006). Since Purchasing has knowledge of prior collaborations with suppliers, Purchasing could contribute not only by assessing new suppliers but also by evaluating prior collaborations. This is important since firms tend to select partners with whom they have a former relationship (Rundquist 2008). Similarly, McDermott and Handfield (2000 p. 54) argue that “Project managers must involve purchasing personnel in helping to identify potential suppliers with a demonstrated record that offer technological solutions to meet market needs.”

However, in situations of technological uncertainty, supplier selection in NPD projects may not be obvious (Eisenhardt and Tabrizi 1995). The initial selection of the supplier becomes an even more critical issue, as the buying company needs to anticipate whether the supplier will remain a technology leader (Handfield et al. 1999). Purchasing can contribute with important input to this selection process by having an up-to-date data base of suppliers for different products and technologies (Wynstra et al. 2003). This can concern a so-called shortlist of prequalified suppliers, but in situations involving new technology this more likely considers specific considerations regarding the supplier’s capabilities, ability to collaborate in NPD, investment possibilities, and innovative performance. In fact, the evaluation and selection of suppliers can be based on multidimensional criteria (Oh and Rhee 2010). For instance, selection criteria can evaluate the supplier according to its technology, production capability, organisation and project commitment (Melander 2010).

Oh and Rhee (2010) describe the supplier selection activity as a joint task of purchasing and R&D. However, when suppliers are involved to bring new technologies into the project, it may be that R&D has the primary responsibility for approaching, evaluating and selecting suppliers (Ragatz et al. 2002). In these cases, and in contrast to more incremental projects, purchasing does not necessarily need to take an active role. In addition, it is not uncommon that technological uncertainty make firms more inclined to deviate from existing procedures for supplier selection (van Echtelt et al. 2008).
2.3 Purchasing’s participation on the NPD project

Alongside with the R&D department, purchasing is the most relevant internal actor in managing the suppliers that are involved in NPD (Dowlatshahi 1998; van Echtelt et al. 2007). Although there are many studies that present findings on managing supplier involvement in NPD (e.g. (Hoegl and Wagner 2005; Lakemond et al. 2006; McIvor and Humphreys 2004; Takeishi 2001; Wagner and Hoegl 2006), fewer studies focus particularly on purchasing’s activities when managing suppliers in NPD projects. Oh and Rhee (2010) propose early involvement of purchasing, i.e. after the product planning phase is completed. Knight and Harland (2005) identify six different roles of purchasing, i.e. as an innovation facilitator, coordinator, supply policy maker and implementer, advisor, information broker and network structuring agent. In NPD projects, the role of purchasing focuses on two aspects, i.e. the interface with the supplier, and the cross-functional leadership role.

The first is focused on solving routine problems with regard to cost, utility, delivery and payment (Oh and Rhee 2010) throughout the project. Here purchasing is acting as a negotiator, facilitator, supplier’s advocate and educator (Wu et al. 2010). A negotiator negotiates contracts, a facilitator resolves conflicts and issues arising in daily operations, a supplier’s advocate communicates the supplier’s needs to the NPD project, while an educator keeps the internal organization up to date on the relationship. To facilitate for purchasing managers, it is argued that firms could lend them greater autonomy, which enhances the supplier’s trust in these persons (Perrone et al. 2003).

The second aspect is related to keeping the internal organization up to date and considers purchasing taking a cross-functional leadership role (McGinnis and Vallopra 1999). This can concern sharing important information and intent, as well as involvement on the evaluations of the new technology, discussion on specification and early quality assurance (Oh and Rhee 2010). In a cross-functional effort, purchasing together with R&D and production, fulfils an important role in the coordination of the development and testing of prototypes (van Echtelt et al. 2008). It has been suggested that purchasing’s activities have become decentralized, as purchasing actively needs to be represented on the development team (Gadde and Håkansson 1994). Moreover, purchasing increasingly needs to integrate with other parts of the business and become team-oriented (Faes et al. 2001).

In technological uncertain situations, firms are more likely to share information with their suppliers especially regarding technology issues (Petersen et al. 2003). In order to facilitate this technology sharing, supplier engineers may be added to the NPD team (Petersen et al. 2003; Ragatz et al. 2002). As Petersen et al. (2003, p. 295) finds “In cases when the supplier possessed high levels of expertise in a technology that needed to be adapted to a particular product development initiative, companies were integrating suppliers very early in the development cycle to take advantage of their expertise situation. Suppliers in such cases often worked closely in buying company design engineers to solve problems related to manufacturability, integration of the technology, cost reduction, and product performance.” The role of purchasing in these situations is not exactly clear. Information sharing with the suppliers increases, but mainly between the supplier engineers and the buying firm’s engineers. Supplier engineers are added to and often even co-located with the NPD team, which increases the information sharing about the technology. However, it is not certain that purchasing gets a more active role. The contrary could be argued as well; in such situations it is more likely that the NPD team with supplier and buying firm engineers largely “play their own game”. Research is though lacking in this area.
3 Methodology

This study is based on three case studies of collaborative NPD projects at one firm. The selected firm is a high-tech system integrator and experienced in collaborating with external technology suppliers. Hence, it we considered the firm to be appropriate for the purpose of this study. The firm has more than 100,000 employees and a worldwide presence. The case study method was chosen in order to gain insight into how purchasing’s role can differ between NPD projects at one corporate group. The case study method is recommended when studying a complex unit with multiple variables (Merriam 1998). The case sampling strategy was intensity sampling, which consisted of sampling information-rich cases that were not extreme, but that demonstrated the phenomenon intensely (Patton 2002). The sampling of NPD projects was to find cases that were suitable for making comparisons. Thus, the selection was based on possibilities for comparison. NPD projects, that were located in the same city and involved technology that was new to the firm provided by external suppliers, were selected. All projects had different suppliers. In the cases, purchasing’s involvement in the NPD projects ranged from very little involvement to being a member of the NPD team.

Data included interviews, internal and external documents, and factory visits. Conducting interviews is a highly efficient method to gather detailed empirical data (Eisenhardt and Graebner 2007). The sampling of respondents consisted of individuals that could influence the NPD projects or who were project members. Hence, it was ensured that the respondents had insight into the project and possessed relevant information. To ensure representativeness, individuals that had different responsibilities and roles in the project were interviewed. Thus, different views of the projects, processes, meetings and decisions that the firms have made were included. The majority of the respondents were engineers that had management positions within the firms. In addition, the individuals responsible for purchasing in the projects were interviewed. In total, 21 interviews were conducted during the time period January to September 2010. The duration of the interviews ranged from one hour to two hours and thirty minutes.

Following Eisenhardt’s (1989) suggestions for data analysis, a dimension was selected; in this analysis, it was purchasing’s involvement in the NPD project. Within this dimension, similarities and differences between the three projects were identified. Thereafter, these discoveries were listed in a matrix. In a comparative analysis, it is recommended that the focus should be on the key variables (Lijphart 1971) to avoid the risk of the researcher becoming overwhelmed by a large number of variables. Thus, to facilitate the comparison, key events in the NPD projects were identified and the process was divided into the different stages of the projects. For instance, the projects were divided into three rough timeframes: technology selection, supplier selection and collaboration with supplier. Finally, to ensure validity, the firms were offered the opportunity to read and comment on the analysed material.

4 Data Presentation

The research presented in this section is based on three case studies, three NPD projects involving external suppliers that provided technology that was new to the firm. In the firm, purchasing is divided into strategic and operational purchasing. In NPD, strategic purchasing can be involved in the projects. However, the firm has no policy that prescribes purchasing’s inclusion in product development. Instead, the firm has guidelines that stress the importance of strategic purchasing’s involvement in collaborative NPD where suppliers are included.
The projects studied were conducted at two different entities at the same firm. Project Alpha and Beta belonged to the same unit (power) whereas project Gamma belonged to another entity (motor) at the firm. However, collaborative NPD projects have similar structures and processes regardless their relation to a specific unit. The three projects studied were relatively small; each had less than ten members on the project team. Project Alpha and Beta were NPD projects that involved technology that had not been implemented in this type of products previously. In contrast, project Gamma was an NPD project that implemented technology that had been used previously in similar products, but not at the firm in focus. Project Alpha included a smaller supplier that was less powerful, while project Beta and Gamma included large suppliers that were equally powerful compared to the buying firm. An overview of the cases’ attributes is presented in table 4-1.

<table>
<thead>
<tr>
<th>Case</th>
<th>Name</th>
<th>Type</th>
<th>Years</th>
<th># of project members</th>
<th>Technology</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Alpha</td>
<td>New to industry</td>
<td>8</td>
<td>&lt; 10</td>
<td>Battery</td>
<td>A</td>
</tr>
<tr>
<td>Case 2</td>
<td>Beta</td>
<td>New to industry</td>
<td>3</td>
<td>&lt; 10</td>
<td>Battery</td>
<td>B</td>
</tr>
<tr>
<td>Case 3</td>
<td>Gamma</td>
<td>New to firm</td>
<td>1</td>
<td>&lt; 10</td>
<td>Bearing</td>
<td>C</td>
</tr>
</tbody>
</table>

4.1 Project Alpha

The NPD project team consisted of individuals from the R&D department and the technical department. Thus, project Alpha started without participation from representatives from purchasing. First, the NPD team made an evaluation of available technologies in order to select the most suitable battery technology. Technical uncertainties that included future technology development, competing technologies performance were considered as well as other factors involving the technical performance of the battery. The project team selected the battery technology that was considered to be most suitable for the application that was to be developed. The technology selected had been developed by supplier A and was proprietary of that firm. Hence, by selecting technology the team had also selected supplier A. Therefore, there was no evaluation of possible suppliers since there was only one firm that developed the technology selected.

This project was operated by engineers who paid little attention to the organisation, commercialisation, and the strategy behind the collaboration with the supplier. Consequently, problems occurred with supplier A. These problems can be divided into technical problems and organisational problems. The technical problems consisted of the supplier’s limited experience in developing batteries according to the buying firm’s requirements. As a solution to the technical problems, the firm invested more resources into helping the supplier with developing and testing batteries. The other problems were complex and comprised several organisational issues. During the project, the communication with supplier A was problematic and the firm did not receive answers to their questions. Moreover, test results were delayed or not presented. Most alarming, however, was that during the project, supplier A changed strategy and was no longer able to produce a large quantity of batteries once they had been completely developed. The supplier’s strategy was now limited to producing prototypes, and the supplier would not be able to manufacture batteries on a large scale. Once these
organisational problems emerged, the project came to a standstill and the NPD team could not find a solution to the problem.

The project team did not know how to proceed with the NPD project. Therefore, the project team contacted purchasing to help solve the organisational problems with the supplier. Purchasing evaluated supplier A according to the firm’s procedures. The result was that supplier A was not qualified to be a supplier to the firm. The supplier’s processes and routines were judged to be insufficient and not suitable for large NPD collaborations. This was partly due to the structure of supplier A which is a small, privately owned company that did not have the necessary resources to handle large and complex NPD projects. Additionally, supplier A’s management demonstrated a lack of interest in the project and could not meet the requirements of the firm. Consequently, it was believed that the supplier did not have the necessary resources or interest for a development project of this scale. Furthermore, the firm had no plans of building its own manufacturing of batteries, which would have been necessary since the supplier’s strategy constricted to only manufacturing prototypes. As a consequence, it was decided to terminate the collaboration with supplier A. Thus, while purchasing was not involved at all in the beginning of the project, its contribution was crucial to solve the impasse situation in the project.

4.2 Project Beta

In this project, the technology was selected by the NPD team after having performed an evaluation of potential technologies. In contrast to project Alpha, the technology selected was supplied by a number of firms. Out of this pool of suppliers, purchasing got the task to select the most suitable supplier for project Beta and present its choice to the project team. Due to time pressure, the supplier selection was mainly based on prior knowledge of the suppliers. Normally, the firm assesses a number of suppliers before selecting one of these, but it was very important that project Beta started as soon as possible because the firm had signed a contract for delivering a prototype to a customer. Consequently, there was no systematic assessment of the potential suppliers. Instead, purchasing had prior knowledge and positive experience of supplier B and suggested this supplier to the development team. The team had no prior experience of this supplier but agreed that supplier B could be a suitable collaboration partner for this project.

The selected supplier was a large firm which was used to collaborate in NPD projects with external firms. Hence, it had processes and structures to handle this type of collaborative NPD project. The buying firm had no knowledge of the new technology and it did not have any plans to learn about the technology. Therefore, it was important to have a technically competent supplier. Once the collaboration with the supplier began, purchasing was no longer involved in the NPD project.

During the project’s progress there were some problematic issues related to the supplier. These concerned the rate of activity and commitment from the supplier’s side on the project. The buying firm found that the activity from the supplier was lower than expected and they did not receive the information they requested. However, there was high activity in connections to project meetings between the firms, but after these meetings the activity on the supplier’s side decreased once again. At one point the supplier did not answer any of the buying firm’s questions and the firm was told that the supplier did not have enough time for the project. The project team at the buying firm was frustrated and did not know how to solve the situation. Then, once the collaborative problems arose, purchasing stepped in and arranged a meeting where the situation was discussed. The solution from the supplier was to appoint a new project manager and proceed with the project with more enthusiasm.
4.3 Project Gamma

In contrast to project Beta, project Gamma included purchasing from the outset. The firm’s supply manager was an NPD project member and thus, was a participator throughout the project. However, the technology selection was made without purchasing’s involvement. It was the R&D department that assessed possible technologies and made a selection, in consultation with an external technical expert. The technical uncertainties related to this technology were more limited than in project Alpha and Beta, as it had been tested and implemented with satisfying results in other products at other firms. This technology is provided by a number of suppliers.

In the assessment and selection of suitable suppliers, purchasing was involved as well as representatives from the R&D department. A number of suppliers were assessed according to technical skills and firm organisation. Hence, technology and organisational issues were evaluated simultaneously. Both the R&D department’s and the purchasing’s opinions regarding the supplier’s characteristics were considered. It was stressed that not only the technology, but also the management and organisational perspectives were important in the supplier selection. Therefore, in the assessment, the NPD project did not only seek the most technically advanced supplier, but also considered its cost and whether or not the supplying firm was an appropriate collaboration partner for this project.

The choice for supplier C was relatively straightforward. The supplier is well-known in its field, technically very competent and has a proven track record. Furthermore, its organisation is similar to the buying firm’s organisation, and it has established routines and processes for conducting collaborative NPD projects. Moreover, the firm had used supplier C as a supplier previously, and thus had been in contact with individuals from supplier C on earlier occasions. However, one issue that arose in the project was the cost level of the technology supplied, as the costs turned out to be much higher than the buying firm had expected. The NPD project had got another view of the cost level when they made the technology selection. Moreover, purchasing had broken down the cost structure of the product and had an idea of what the cost ought to be. Therefore, the supplier and the firm had a conflict regarding the cost of the technology. However, to solve this issue the NPD team, including purchasing, visited the supplier’s production. At this visit, the firm got a better understanding for the cost structure. After the visit, the firm helped supplier C to consider alternatives for the manufacturing processes in order to lower production cost. The firm stressed that supplier C’s role was not limited to developing a product, but included being a team player that was a part of the firm’s competition against other firms. It was important for the firm that supplier C understood the business situation, the product and what the customers require from the product. The NPD project was to be viewed as the beginning of a longer collaboration in which the supplier C was the firm’s partner. Therefore it was important for the firm to have supplier C’s commitment and belief in the product.

5 Analysis and Discussion

In absence of a prescribed role of purchasing in NPD, the projects display several differences. Project Alpha had no involvement of purchasing in the beginning or during the project’s progress. It was once problems emerged that purchasing became involved and it was decided that the collaboration with the supplier would be terminated. In contrast, the supplier selection in project Beta was based on purchasing’s prior knowledge of the supplier, but was not based on a thorough and systematic assessment. Also in this project, purchasing was not involved on a continuous basis. But once major problems with the supplier emerged,
purchasing was contacted to help the project team solve them. The final project, project Gamma, included purchasing in the supplier selection to help with evaluating potential suppliers. Moreover, in this project purchasing was a member of the project team throughout the project. Hence, the role of purchasing varied in the three NPD projects; this is illustrated in table 5-1.

Table 5-1 Variation of purchasing’s role in the NPD projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Technology selection</th>
<th>Supplier selection</th>
<th>Team member</th>
<th>Role in project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>No participation from purchasing. Selection made by project team</td>
<td>No participation from purchasing. Only one supplier provided the selected technology</td>
<td>Purchasing was not a member of the NPD team</td>
<td>Purchasing was involved in the NPD project as a trouble-shooter</td>
</tr>
<tr>
<td>Beta</td>
<td>No participation from purchasing. Selection made by project team</td>
<td>Purchasing selected the most suitable supplier</td>
<td>Purchasing was not a member of the NPD team</td>
<td>Purchasing was involved in the NPD project as a trouble-shooter</td>
</tr>
<tr>
<td>Gamma</td>
<td>No participation from purchasing. Selection made by the R&amp;D department in consultation with an external expert</td>
<td>Purchasing and the R&amp;D department selected the supplier together</td>
<td>Purchasing was a member of the NPD team</td>
<td>Purchasing was involved continuously in the NPD project as a team member</td>
</tr>
</tbody>
</table>

In all three cases purchasing was not involved in the technology selection at all. R&D may consider this to be within the domain of the R&D department and does not consider involving purchasing in this decision. Previous research has argued that, especially in technological uncertain projects, the technological selection is an unambiguous decision and can consider suppliers that previously have been considered to be outside the scope of the industry. Consequently, R&D not always considers purchasing to be able to provide relevant input to the technology selection process (Ragatz et al. 2002). This is not completely confirmed in our cases, where purchasing was not involved in technology selection in any of the projects. Even in project Gamma, where the technology was known in the industry, purchasing was not involved. Instead, the R&D department largely performed the tasks of finding, assessing and selecting the technology. It must be mentioned that at this stage, interaction with the potential suppliers are rare, and that in our cases technology selection is largely based on secondary information. So, although technology selection largely limits the choice for suppliers, purchasing’s role is neglectable. In the projects studied, there was no indication that purchasing formulated technology roadmaps (Schiele 2010), instead it was the R&D department that was responsible for strategic technological decisions in the firm.

An important trigger for involving purchasing is when actual contacts with suppliers need to be established. In our cases this occurs at the moment of supplier selection. In two of the projects, purchasing played an active role in the selection of suppliers. In the first project Alpha, purchasing was not involved as the technology selection limited the possible suppliers to only one. Here, the firm was locked into one particular supplier (Handfield et al. 1999) due to the technology selection. Therefore, by selecting technology the firm automatically selected the supplier as well. As reported in the literature, it is common to include purchasing in the supplier selection for NPD projects (McGinnis and Vallopra 1999; Schiele 2006).
is in accordance with our findings, where purchasing was actively involved in supplier selection in two of the studied projects. In these projects, the number of potential suppliers was limited and determined by the selected technology, which narrowed purchasing’s action space. In the supplier selection, purchasing provided information about the suppliers’ products, as shown in other studies (see Wynstra et al. 2003), and the suppliers’ organisation and NPD procedures. However, purchasing was not the main source of information about the suppliers’ technology. Instead, the technologies were investigated by the R&D department of the firm. Therefore, this study only partly confirms the suggestion by Wynstra et al. (2003) that purchasing provides information regarding the suppliers’ products and technologies. Instead, it seems that R&D fulfils an equally important role in technological uncertain projects.

Most surprisingly, the results show a rather low degree of continuous participation of purchasing throughout the NPD project. Only in project Gamma, which also was the shortest project, purchasing became a member of the project team and supported the project continuously. It may be that it is easier to establish commitment to involve purchasing continuously, from purchasing as well as R&D, when the NPD project does not take several years. Previous research has argued that, in order for purchasing to be included in the NPD process, it must adapt its organisation for long-term technical development. This follows the discussion that purchasing strategies need to be aligned with the firm’s strategies, and to have a long-term perspective (Cousins et al. 2006; Narasimhan and Das 2001). In addition, Faes et al. (2001) suggest that purchasing needs to be team-oriented. Our study provides complementary insights with results showing that despite a low degree of continuous participation throughout the NPD project, purchasing may have an important role in assisting R&D when major problems arise. This study shows that purchasing can assist the NPD project without being a member of the NPD project team.

So, what is the role of purchasing when involving technology suppliers in technological uncertain NPD projects? Previously, it has been proposed that purchasing has a supporting an facilitating role in the NPD process (Knight and Harland 2005; Schiele 2010). In addition, purchasing’s role can also cover being active both within the firm and outside the firm as an innovation facilitator (Knight and Harland 2005). Indeed, in the projects studied in this paper, purchasing did support the NPD project by participating in the supplier selection and solving major issues that emerged during the projects. Furthermore, purchasing was active both within and outside the firm. However, purchasing did not respond to daily requests from suppliers as suggested by Knight and Harland (2005), instead purchasing responded rather to problems related to the supplier collaboration. To solve these issues, purchasing acted actively outside as well as within the firm.

Additionally, the literature has identified a role of purchasing as facilitator (Wu et al. 2010 p. 820) which “portrays the supply manager as being in the middle between the buyer and supplier” and solves problems that occur in the daily operations. Furthermore, the suggested role of purchasing as advisors (Knight and Harland 2005 p. 287) can be viewed as advisors being “called upon to provide formal and informal advice” and in some cases working as a supply expert. The roles discussed above describe purchasing as facilitating, advising and solving minor problems that occur in daily operations in NPD projects, and suggest a close involvement of purchasing. However, these roles do not portray purchasing as an external expert, a trouble shooter, which solves larger problems. This study has shown that purchasing also has a crucial role as a trouble-shooter in NPD projects, taking a more outside perspective to the on-going supplier relationship which is mainly R&D driven.

This study suggests that a trouble-shooter solves problems in the NPD that have a large impact on the project. In two of the projects, purchasing was not involved on a regular basis,
but more as an occasional trouble-shooter. Purchasing was contacted when the projects were at a standstill due to major problems related to the supplier. The problem that occurred in project Alpha, which was solved by purchasing, concerned whether the firm should continue the collaborative NPD project with the supplier at all. The problem was a conflict with the supplier, where on the one hand the supplier did not manage to develop the requested item and on the other hand, the supplier had changed their business plan from mass-production to a small prototype production. In project Beta, there was a problem due to lack of commitment from the supplier where purchasing was called in as an external expert to solve the issue. The problem evolved around a lack of communication, low interest from the supplier and limited input from the supplier. As demonstrated, these problems affected the NPD projects to such a large extent that the projects could not continue before the issues were solved.

To solve these problems, it was not necessary for purchasing to be present during the entire NPD project. In contrast, purchasing’s role as a trouble-shooter could be facilitated by a low degree of continuous involvement in the supplier collaboration. By not being a project member, purchasing could, in project Alpha, evaluate the situation without being biased and stay objective in the assessment of the situation and the decisions leading to it. The purchasing manager describes the situation as difficult for the project members: “For the engineers it was painful to terminate the collaboration with the supplier because they had selected the supplier and collaborated with the supplier for a number of years.” Similarly, in project Beta, purchasing could enter the project as an outsider, evaluate the situation objectively and solve it without having participated in the debate when the problem started escalating. By not being a part of the project, purchasing could be engaged as an external trouble-shooter and act less biased by personal relationships and previous commitments. In fact, purchasing could act as a trouble-shooter and leaving the personal relationships between the individuals in the NPD project and at the supplier largely unaffected.

In the project where purchasing was a member of the NPD project team, as suggested by Gadde and Håkansson (1994), purchasing also had a role as trouble-shooter. The problem in this project was related to the cost of the technology, which has been argued to be the responsibility of purchasing (Schiele 2010). Similarly to the other projects, this issue was solved by communicating both inside the firm, with the project team, and outside the firm, with the supplier. In contrast to the other projects, purchasing was not an outsider in this project. Therefore, the role of purchasing as a trouble-shooter does not necessarily need to be bounded to purchasing acting as an outsider. However, it may be that in these situations purchasing is more entangled in the relationship, through personal relationships, previous experiences and commitments.

In this study, the three NPD projects varied in some aspects, which have limited the comparison of the projects. For instance, with regard to time, project Alpha was an eight year project while project Beta was three year and project Gamma was a one year project. On the one hand, a longer collaboration suggests that the relationship could be stronger between the participants. A longer and more expensive NPD project would need a more thorough selection of the supplier. On the other hand, it may be difficult to get a commitment from R&D as well as purchasing to involve purchasing closely in these longer projects. Instead, as long as market release is far away, these projects may be largely R&D driven. This latter situation seems to apply to our cases.

6 Conclusions

At the outset of this paper, we intended to explore the role of purchasing in technology selection, supplier selection, and participation in NPD projects involving technology
suppliers. The study has shown that purchasing has a very limited role in the technology selection for NPD projects, that supplier selection is not always performed systematically, and that purchasing’s involvement throughout the NPD project is limited. Not all our findings are in accordance with the literature, which usually provides arguments for involving purchasing deeper, better and more frequently in NPD projects. It might be that our cases are just examples of bad management, but the cases are performed at a large and well-performing player in the industry, with a long tradition of supplier collaborations. Furthermore, the cases also display important state-of-the-art practice in industry, in our opinion not only confined to the specific firm in focus. Consequently, we would like to suggest that our study provides indications that supplier collaboration with technology suppliers are managed differently from NPD projects where suppliers’ input mainly consist of manufacturability issues. In these latter projects, purchasing may have a more prominent role than in collaborations with technology suppliers. Instead, collaborations with technology suppliers tend to be more R&D driven. It might be that purchasers and purchasing research relying on the perspectives of purchasers rather overemphasize purchasing’s role in realizing collaborative NPD projects regarding new technology. To some extent, purchasing may be facilitating innovation, by supporting R&D, but collaborative innovation is still realized in interaction between R&D engineers and supplier engineers. Of course, this would be differently when talking about standard off-the-shelf supplier products which can be implemented without any supplier involvement.

Still, the results of our study show that purchasing has an important role during the NPD projects, in supplier selection and more importantly as a trouble-shooter. In supplier selection, purchasing builds on previous experiences with suppliers and/or a thorough assessment of the potential suppliers. When including issues related to technical capabilities of the supplier, this seems to become a joint effort between R&D and purchasing. Furthermore, the role as a trouble-shooter refers to purchasing stepping in to solve major problems that have emerged in the NPD project. This can concern a lack of commitment and interest from the supplier, conflicts where the supplier has changed its strategy, or conflicts regarding the cost of the technology. To solve these problems, purchasing does not need to be a member of the NPD project, but can step in occasionally.

This study is based on three cases studies and thus generalization is limited. Further research could investigate purchasing’s trouble-shooting role further, by for instance focussing on how common this role is in technological uncertain collaborative projects, systematically investigate the major issued that are resolved by purchasing, and compare purchasing’s role in trouble-shooting as an outsider and insider to the project. Furthermore, we encourage more studies specifically considering the involvement of technology suppliers in NPD projects.

7 References


