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Intercompany Engagement Processes Revisited

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Abstract

Companies must look for new sources of business success, thus it is essential to recognize that a company cannot achieve its objectives only through internal knowledge and capabilities. Successful companies have identified that engaging in collaborative relationships with other companies is an important value driver for them.

In an earlier empirical study we have recognized that there is a mismatch between the intercompany relationship success factors and the evaluation criteria many companies utilize during supplier selection and qualification. Thus the companies being evaluated have to meet several different criteria and performance standards. We have identified a set of criteria through which measuring the existence of the success factors would be possible a priori.

We will continue with the empirical data to study the question: How should these criteria be applied? I.e. what would be an appropriate process of supplier qualification to be used in order to assure successful collaborative engagements?
1. Introduction

1.1. Background

There is a growing appreciation among researchers that the roots of the competitive advantage are changing. Companies must look for new sources of business success. Managing business relationships has become a significant source of competitive advantage (Mota and Castro, 2002). It is essential to recognize that a company cannot achieve its objectives only through internal knowledge and capabilities. Thus the significance of purchasing and supply management function in the external resource management role is increasing. Successful companies have identified that business relationships are an important value driver for them (Wimmer and Mandják, 2002; Leek et al., 2002).

During the last decades supplier evaluation and qualification have received a remarkable research attention. Though having reasonable commonality, the results of these studies also provide for controversy.

The environment of several businesses has become more complex through trends like: globalization of supplier sourcing, increased outsourcing, and increased collaboration between buyers and their suppliers (Iandoli et al., 2003). A describing example of such an industry is electronics manufacturing. Some of its typical characteristics are heavily impacting the relationship management and thus supplier qualification within it: High clockspeed of the whole industry including rapid technology renewal and short product life cycles; Materials are typically marketed and acquired from global markets; Materials represent a dominant proportion of
manufacturing costs (even above 90%); There is a general downward trend in component and material prices; To an extent the industry is vertically integrated, which lead to business relationships even between direct competitors; Electronics manufacturing is typical assembly industry in which products are assembled from components acquired from the market or to an extent through vertical integration to component manufacturing (Juhantila, 2002a).

1.2. Motivations and objectives of the study

In an earlier empirical study we have recognized that there is a mismatch between what are considered to be the attributes of a good supplier and the evaluation criteria many companies utilize during supplier qualification. Additionally, the criteria different companies apply have only a limited amount of commonality between each other. Thus companies being evaluated by potential customers have to be able to meet several different criteria and performance standards simultaneously. Another source of controversy is the mismatch between any of the criteria used by the studied companies and criteria proposed in the literature. Furthermore the difference between the published supplier qualification criteria of electronics manufacturing companies and the preferences of the actual decision-makers indicates that the decisions for which the qualification criteria are used involve a significant amount of subjectivism. (Juhantila and Virolainen, 2003). This controversy is clearly demonstrated in table 1.1, which lists the respective empirically recognized attributes in a prioritized order.
### Attributes of a good supplier

<table>
<thead>
<tr>
<th>Attributes of a good supplier</th>
<th>The most common supplier qualification criteria</th>
<th>Supplier qualification decision-makers’ preferred criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality</td>
<td>Overall quality management including related processes and systems</td>
<td>Product quality</td>
</tr>
<tr>
<td>Delivery accuracy</td>
<td>Manufacturing process related quality control mechanisms</td>
<td>On-time delivery</td>
</tr>
<tr>
<td>Responsiveness / Service</td>
<td>Education and training of employees</td>
<td>Potential to flexibly meet the future capacity needs of you as a customer</td>
</tr>
<tr>
<td>Low / competitive cost</td>
<td>Product development skills and capabilities</td>
<td>Price</td>
</tr>
<tr>
<td>Competitive price</td>
<td>Equipment calibration</td>
<td>Quality management system</td>
</tr>
<tr>
<td>Advanced technology</td>
<td>Product control</td>
<td>Long term strategy match with buying company’s strategies (product/technology roadmaps etc.)</td>
</tr>
<tr>
<td>Co-operation / partnership</td>
<td></td>
<td>Process quality (implementation of SPC, process capability studies etc.)</td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure analysis, corrective actions and continuous improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>continuous improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good quality control system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical know-how</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactive communication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.1. Comparison between the attributes of a good supplier, the most common supplier qualification criteria and Supplier qualification decision-makers’ preferred criteria (Juhantila and Virolainen, 2003).

Supplier qualification is an integral part of the intercompany engagement process continuum (see figure 1.1). It is essential to understand that companies need to leverage the complementary assets and capabilities of other organizations (Blomqvist et al., 2002, Varis et al., 2004). The foundation of supplier qualification is formed by the corporate strategy of the company and the related purchasing.
strategies, which act as a trigger for the supplier qualification (Juhantila, 2002b). The process of supplier qualification is not utilized without a specific cause like: a detailed evaluation of existing supplier / customer portfolio; company policy change; change in requirements; or dissatisfaction with existing supplier / customer (Ford et al., 1998). I.e. the trigger needs to exist before the process is applied. This study will explore the nature of these triggers.

Figure 1.1. Supplier qualification process continuum; and its key inputs and outputs.

Integrating supplier qualification to the processes of strategic management provides for top management support and commitment, which has been identified to be one of the prerequisites of successful collaborative engagement (Ellram, 1995a). Thus it can be assumed that a well functioning supplier qualification process uses the output of company’s strategy process as a key input. The first objective of this study is to explore if this essential link exists in electronics manufacturing industry.
The culmination point of the process is the qualification decision. It has been proposed by several authors that in order to enable uncomplicated management of longer-term collaborative supplier relationships, cross-functional teams should execute the qualification decisions. As Pearson et al. (1996) have argued, purchasing can achieve a strategic status within an organization only if it has an access to participate in the work of cross-functional decision-making teams – in return this provides for cross-organizational acknowledgement of purchasing. A related question of research interest is whether this recognized good practice is applied by electronics manufacturing industry.

However, as identified earlier, there is a significant amount of controversy in the evaluation criteria companies apply and literature propose for use during the supplier qualification. Another objective of this study is to explore the actual processes used by electronics manufacturing industry and thus potentially identify what would be the elements or a pattern of an appropriate process of supplier qualification to be used in order to assure successful collaborative engagements.

The questions are explored from two complementary directions. First there has been conducted a literature survey on relevant earlier research and theories. Secondly there has been conducted an empirical study within electronics manufacturing industry to understand the respective practical business processes and their application.
1.2.1. Research questions

1. Does the essential link between corporate strategy and supplier qualification exist in electronics manufacturing industry? I.e. is the output of corporate strategy used as a key input to the supplier qualification process?

2. Is the recognized good practice of using cross-functional teams as supplier qualification decision-making authority applied by electronics manufacturing industry?

3. Which are the actual supplier qualification processes used by electronics manufacturing industry?

2. Theory review perspective to supplier qualification processes and systems

The need for linking supplier qualification and the strategic management decisions has been clearly demonstrated by earlier research. Carter and Narasimhan (1996) have identified five factors assuring purchasing function’s strategic position within the company: close linking of purchasing management goals with company-level strategies; intra-purchasing organizational efficiency; close relationships with suppliers; active integration with other functions; and a proper atmosphere within the purchasing organization. Interaction is the key to being able to derive a purchasing strategy from a corporate one. This generates the necessary congruence between the two (Leenders and Blenkhorn, 1988).
When observing the process of supplier qualification, literature suggests several alternatives. The four processes described below are representative examples of what literature proposes as good practices. Ellram and Edis (1996) propose a five-phase process consisting of: the preliminary phase of establishing the need, forming an action team and conforming the needed management support; identifying potential partners; screening and selecting; establishing the relationship; and evaluating the relationship. Lewis (1995) has a four-step process model of: Derive product or service objectives – in terms of projected price, cost, quality, technology etc. using benchmarking, competitive analysis and market research; Develop, from scanning and benchmarking, a list of potential suppliers; Determine potential supplier’s interest; And dispatch a team to narrow the field. The most detailed of the explored processes is the one described by Underhill (1996): commodity/service evaluation; establishment of commodity/service teams; internal customer needs evaluation; cost driver evaluation; internal opportunities evaluation and possible enhancement in terms of the nominated team and applied processes; review of potential suppliers; initial evaluation of suppliers; evaluation of supplier’s performance and systems; decision; internal customer and management endorsement; and implementation. The fourth one is an empirical model developed by Juhantila (1998): search and recognition of potential suppliers; preliminary relationship creation; formation of a common operations model; relationship management and reinforcement.

A commonality between all of the four above is that they effectively support the four-phase relationship evolution process suggested by Ford et al. (1998). This evolutionary process follows a four-phase pattern of pre-relationship, exploratory,
developing and stable stages. Some of the processes may have more than the four phases mentioned, but the additional ones are typically only adjustments of the attributes. Another commonality is that they all involve a distinctive decision point for qualifying the supplier candidate. Ellram and Edis have it at phase 3, Lewis after step 4, Juhantila at the third step and Underhill at the final stage: the implementation phase.

Whatever the process applied, an authority for decision-making needs to be clearly specified to enable consistent decisions. The sources of information for the supplier qualification process (above) and criteria (see table 1.1) suggest – directly or indirectly - decision-making authorities listed in table 2.1. It should be recognized that some bias might be caused by the scope of the particular text: whether it is pure supplier qualification, outsourcing or partnering/strategic alliances.

<table>
<thead>
<tr>
<th>Author</th>
<th>Decision-making authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baily, Farmer, Jessop and Jones (1994, pp 124-136)</td>
<td>Buyer</td>
</tr>
<tr>
<td>Ellram (1990)</td>
<td>No reference</td>
</tr>
<tr>
<td>Ellram and Edis (1996, p 22)</td>
<td>Worldwide, cross functional team</td>
</tr>
<tr>
<td>Gay and Essinger (2000, pp 125-126)</td>
<td>Outsourcing team and management</td>
</tr>
<tr>
<td>Goldfeld (1999, p 63)</td>
<td>Cross-functional commodity teams (the reference is, however, to supplier selection rather than qualification)</td>
</tr>
<tr>
<td>Greaver (1999, p 44)</td>
<td>Cross-functional team</td>
</tr>
<tr>
<td>Lewis (1995, pp 30-31)</td>
<td>Multifunctional team</td>
</tr>
<tr>
<td>MacBeth and Ferguson (1992, pp 166-167)</td>
<td>Cross-functional team</td>
</tr>
<tr>
<td>Partnership Sourcing Ltd. (Saunders, 1997, p 267)</td>
<td>No reference</td>
</tr>
<tr>
<td>Underhill (1996, p 31)</td>
<td>Commodity/service team</td>
</tr>
<tr>
<td>White and James (1996, p 50)</td>
<td>Cross-functional team</td>
</tr>
</tbody>
</table>

Table 2.1. Supplier qualification decision-making authorities.
Most of the authors referred to suggest that a cross-functional, multifunctional or other equal multi-discipline team should make the decisions. Creating such cross-discipline involvement provides clear benefits in terms of performance improvements as well as cost and cycle-time reduction (Chapman et al., 1997). As an example: at Chrysler the implementation of cross-functional (product development) teams has enabled avoidance of conflicting messages to suppliers; improved coordination, continuity and trust both internally within Chrysler and between Chrysler and its supplier base; and better stability in relationships (Dyer, 1996).

### 3 Empirical study

#### 3.1 Methodology

To maintain the strategic relationship perspective outsourcing of secondary functions, MRO purchases and other trivial buying situations have been excluded from the study. Instead the focus is on collaborative relationships. All studied situations as well as the respective respondents are related to managing relationships with suppliers of components, materials and assemblies. Electronics manufacturing was selected to be studied due to the mentioned industry characteristics.

The empirical part of this study consists of a survey conducted using self-administrated questionnaires. To avoid any potential confusion, an instruction document was created and distributed to the respondents with the questionnaire to provide advice on how to respond. Additional preventive actions were taken to avoid
disadvantages of self-administrated questionnaires as much as possible (Fowler, 1993). The validity and clarity of the survey design and questions were tested by allowing four experienced purchasing practitioners to study them and provide feedback. The questionnaire was adjusted accordingly and reply instructions were created. To assure the quality of responses the researcher was either available to answer any questions from the respondents or an opportunity for an anonymous discussion was provided in the form of e-mail discussions through a focal person in each company. Special attention was paid in formulating the questions to assure clarity and to make sure that each respondent understood the questions in a similar manner. For the same reason universally recognized terminology was used.

Critical sampling issues were considered to assure the accuracy of the survey (Fowler, 1993). Probability sample was not considered to be relevant for this research because the participants have been purposefully selected. The sampling plan’s comprehensiveness was assured by involving companies with comparable businesses and wide geographical coverage including companies from Asia-Pacific, Europe and North America. The size of the sample is not intended to provide a full confidence over the whole industry. It does, however, provide a representative sample from among the selected companies, which on the other hand form a good representation of the electronics manufacturing industry. The design was highly influenced by the companies’ willingness to participate. The participants were selected in a manner, which enabled the highest possible response rate. This was assured by a prior request from a number of companies. Only such companies, which agreed to participate in the first place were included in the sampling plan. Originally the plan was to include 14 companies. During the pre-selection and
screening two of the intended companies declined. To maintain the desired global coverage and representativeness, two additional companies were included. Still, however, one company was not able or willing to provide answers to the questions relevant to this particular study. Thus the general response rate was 92.9%. As several companies consider their business processes to be trade secrets only seven of the companies were willing to reveal detailed information concerning their supplier qualification process. Thus the respective response rate of this particular section remained at 50%.

3.2 Description of the data

The empirical data was collected between January 2001 and May 2002. The lengthy period of data collection is explained by the fact that this particular study is a part of a larger empirical research program. The data for its independent sections were collected simultaneously. Some of the sections have already been published and some will be published in other contexts. The companies involved in the empirical research – leading electronics OEM companies of Asian, European and North American origin - wish to remain anonymous. Thus they are referred to as OEM 1 to OEM 14.

Of the thirteen companies, which replied to the question about the existence of a supplier qualification process, twelve had a formal system for qualifying suppliers. Appendices 1 – 3 demonstrate five processes applied by six of the companies. The similarity of the processes applied by OEM 10 and OEM 14 is due to the two being
independent divisions of the same corporation. Despite of the similar process its application is different, which can be observed for instance from their definitions of the decision-making authority. In addition to the process flow charts a letter from OEM 8 explains practices used by them:

“Most of our parts are leveraged from one product to the next, so we deal with the suppliers who perform the best for us. If we have the need to select a new supplier, the product designers will specify the performance requirements of the part. Our procurement engineers and buyers will work with the designers to establish a list of suppliers who are capable of providing the part. We will then request a quote, and begin discussions with the prospective suppliers. Their technical capabilities, quality commitments and price will be leading determinants of whether or not they get the business. We will also rely heavily on the supplier’s personnel and our relationship with them; i.e., trust, confidence, etc. Obviously, there is no perfect supplier, but we will look for a good balance in the many criteria.”

Table 3.1. demonstrates the supplier qualification decision-making authorities.

Majority of the companies studied have established cross-functional teams for the decision-making – this is the practice in nine of the thirteen companies, which provided the information. In two companies the authority is case dependent, one company has empowered supplier quality engineering and one purchasing managers respectively.
<table>
<thead>
<tr>
<th>Company</th>
<th>Decision-making authority</th>
<th>Cross-functional team members (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM 1</td>
<td>Cross-functional team</td>
<td>Product engineering, Supplier quality engineering, Sourcing, R&amp;D</td>
</tr>
<tr>
<td>OEM 2</td>
<td>Cross-functional team</td>
<td>R&amp;D, Procurement, Supplier quality engineering</td>
</tr>
<tr>
<td>OEM 3</td>
<td>Cross-functional team</td>
<td>Sourcing, R&amp;D, Quality control</td>
</tr>
<tr>
<td>OEM 4</td>
<td>Cross-functional team</td>
<td>R&amp;D, Sourcing, Quality control</td>
</tr>
<tr>
<td>OEM 5</td>
<td>Supplier quality engineering</td>
<td></td>
</tr>
<tr>
<td>OEM 6</td>
<td>Cross-functional team</td>
<td>R&amp;D, Purchasing, Production, Quality, Software, Technical</td>
</tr>
<tr>
<td>OEM 7</td>
<td>The approval decision is dependent upon numerous factors which include but are not limited to: Complexity of component, Component's technical and/or commercial importance as it relates to the product: custom vs. standard material, dollars, contract or spot buy, established and qualified supplier, new design, global commodity or managed by individual site</td>
<td>Sourcing, Purchasing, Engineering (design and process), Quality (supplier and internal), Finance, Product managers, Project managers</td>
</tr>
<tr>
<td>OEM 8</td>
<td>Cross-functional team</td>
<td>Design engineer, Materials engineer, Buyer, Larger assemblies may require higher levels of management approval</td>
</tr>
<tr>
<td>OEM 9</td>
<td>Cross-functional team</td>
<td>Materials, Quality management, Engineering, Supplier relations, Finance (to certain extent)</td>
</tr>
<tr>
<td>OEM 10</td>
<td>Cross-functional team</td>
<td>Depending on the commodity, typically procurement, sourcing, R&amp;D, quality etc.</td>
</tr>
<tr>
<td>OEM 11</td>
<td>No response</td>
<td>No response</td>
</tr>
<tr>
<td>OEM 12</td>
<td>Depending on the case</td>
<td></td>
</tr>
<tr>
<td>OEM 13</td>
<td>Purchasing manager</td>
<td></td>
</tr>
<tr>
<td>OEM 14</td>
<td>Cross-functional team</td>
<td>Research, technology &amp; standardization, Product program, Sourcing, Finance</td>
</tr>
</tbody>
</table>

Table 3.1. Supplier qualification decision-making authorities.
3.3 Analysis and findings

The data collected through the survey questionnaire provides opportunities for various ways of analyzing the results and drawing conclusions. Pattern matching has been used to compare and analyze decision-making authorities and supplier/customer qualification processes of involved companies as well as those identified in the respective literature.

*Does the essential link between corporate strategy and supplier qualification exist in electronics manufacturing industry? I.e. is the output of corporate strategy used as a key input to the supplier qualification process?*

When observing the linkage of the supplier qualification processes and the strategic management processes of the companies studied, it is evident that this link does not really exist. Only in case of OEM 10 and OEM 14 the outputs of the corporate strategy serve as a kind of an input to the supplier qualification process.

*Is the recognized good practice of using cross-functional teams as supplier qualification decision-making authority applied by electronics manufacturing industry?*

Using cross-functional teams in supplier qualification decision-making is a common practice within electronics manufacturing industry even though not applied by all of the studied companies. The teams are, however, different in terms of size and functions the members represent. Purchasing and R&D are represented in all of the teams: other members are company dependent.
Which are the actual supplier qualification processes used by electronics manufacturing industry?

Several companies consider their business processes to be trade secrets. For this reason it was not possible to obtain the process descriptions or flow charts from all the participating companies. The ones obtained are presented in appendices 1-3. A clear commonality between the presented systems is that they all include an assessment or equal evaluation of the supplier candidate’s capabilities. Some differences are, however, in steps before and after the assessment evaluation: OEMs 1 and 4 begin the process with a pre-evaluation, which in the case of OEM 1 is a survey and in the case of OEM 4 a self-assessment completed by the supplier candidate; The process applied by OEMs 10 and 14 includes a similar survey, however, preceded by an active scanning of potential alternatives; Scanning is a feature included in OEM 12’s process as well; OEM 6 has a completely different starting point - its process is initiated by a need for a particular product to be purchased as introduced by R&D. In all cases the assessment evaluation is the final trigger for an approval or a rejection. In the case of OEMs 10 and 14 this is complemented by an active monitoring, which is again a common feature with OEM 12. OEM 12, however, includes in its process a negotiation of a formal agreement as well. OEM 6 complements the initial selection process by re-doing it in order to qualify a dual source to secure supply.
4. Conclusion

Several authors have proposed, for example, the use of tools like AHP - analytical hierarchy process (Nydick and Hill, 1992. Barbarosoglu and Yazgac, 1997. Masella and Rangone, 2000. Cebi and Bayraktar, 2003), ANP – analytical networking process (Sarkis and Tallari, 2002), categorical methods (Timmerman, 1986), DEA – data envelopment analysis (Liu et al., 2000. Braglia and Pertoni, 2000), LGP – lexicographic goal programming (Cebi and Bayraktar, 2003), MAUT – multi attribute utility approach (Min, 1994), TCO – total cost of ownership (Ellram, 1995b) to support purchasing decision-making. The evidence collected from the survey interviews, however, did not provide evidence that these tools would be applied in the electronics manufacturing industry.

Even if several researchers have confirmed that it would be beneficial to apply a process continuum similar to the one shown in figure 1.1, the industry practices are different. This indicates that the purchasing decisions may not always be aligned with the strategic management’s expectations, which increases the risk of lack of commitment to long-term collaborative intercompany engagements.

Based on the available evidence, the practical business process of supplier qualification would have a six-phase pattern of:

1. Establishment of a need for the relationship (derived from the corporate strategy and respective related purchasing strategies or initiated as a result of evaluation in 6 below).
2. Search and identification of potential partners.
3. Screening and selecting.
4. Decision.

5. Relationship establishment.

6. Continuous management, evaluation and reinforcement.

There is a clear interrelation between the supplier qualification process continuum (see figure 1.1) and the six-phase practical business process. However, the original process continuum would need to be enhanced by adding the fifth step: continuous management, which in turn partially contributes to the need for establishing new relationships. Thus there can be identified two alternative triggers for applying the process: input from the corporate / purchasing strategy and feedback from the continuous management phase. The six phases complement the process continuum as demonstrated in the figure 4.1.

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**Figure 4.1.** The enhanced supplier qualification process continuum’s interrelationships with the six-phase practical business process of supplier qualification.
According to the literature review and our empirical analysis the step one of the continuum (and partly the step two) is an underdeveloped area in supplier qualification (compare de Boer et al., 2001). The literature review revealed that most attention is paid to the step four.

Current literature proposes that cross-functional teams should manage the process and related decision-making (step four above). This is important in order to gain commitment to the decisions made and to assure that they can be executed. To enable team effectiveness attention must be paid not only to the effectiveness of the team behaviour but also to unified decision-making guidelines and criteria. When observing the evaluation criteria proposed by literature and applied by the studied companies it is evident that the criteria do not address any of the earlier identified attributes of a good supplier. Thus there is a risk of misjudgements when applying a supplier qualification and evaluating suppliers using the related criteria.

5. Managerial implications

There is a clear need to further develop the supplier qualification related business processes applied by the electronics manufacturing industry. In some cases the development need refers to the supplier qualification process itself and related evaluation criteria - mostly, however, to the missing link between the strategic management process’ output and supplier qualification process’ input. Use of cross-
functional teams for executing supplier qualification decisions has been identified as a good practice and thus it should be applied more widely than currently.

It would be very important to understand that usually the most attention has been paid to the decision-making phase of the supplier qualification process continuum. The earlier phases, which link the decision-making to the corporate strategy should receive much more attention. The quality of the entire supplier qualification process and its outcome is mainly dependent on the quality of the first process phases. These steps should include, among many other issues, the evaluation of internal and suppliers’ capabilities. In fact, companies are often buying - not only products, but – capabilities of their suppliers.
References


Appendix 1. Supplier qualification processes used by OEM 1, 5 and 6.
Appendix 2. Supplier qualification processes used by OEM 12.
Appendix 3. Supplier qualification processes used by OEM 10 and 14.