

Critical Success Factors When Performing a Superior Supplier Evaluation

- A Benchmark Study at Sony Ericsson and Tetra Pak

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Abstract

Title: Critical Success Factors When Performing a Superior Supplier Evaluation – a Benchmark Study at Sony Ericsson and Tetra Pak

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Problem discussion: Long-term supplier relationships have become more common. Hence, supplier evaluation is a critical activity for many companies. However, making a relevant supplier evaluation is time consuming. Therefore, it is important to decide which of the suppliers to put an extra effort on. Should all suppliers be evaluated in the same way? Previous, focus has been on purchasing of direct material. However, what are the requirements to perform a supplier evaluation within *indirect* purchasing? Companies tend to invest in ERP systems. In what way can an ERP system be utilized in order to make the supplier evaluation process more effective?

Purpose: The purpose of this master thesis is to determine the requirements to perform an effective supplier evaluation of indirect purchasing and critically examine in what ways companies can use an ERP system as a tool to improve the efficiency of the evaluation process. Furthermore, the purpose is to develop a supplier evaluation model, which can be used as a framework when evaluating suppliers.

Methodology: A benchmarking process was used in order to conduct this master thesis. The research question required an understanding of the complexity of the purchasing process. Also, the

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interviewees' specific opinion had to be taken into consideration when making the conclusions. Hence, a cross-fertilization of the System Theoretical and the Interpretive paradigm was used as a framework when initiating the study. Furthermore, the study had a qualitative approach where the main empirical findings were based on interviews.

Conclusions:

The findings concluded are separated in a long-term and a short-term perspective.

First, three Critical Success Factors, which companies are recommended to focus on, are identified:

- Companies should have knowledge about what they purchase
- Companies should have a controlled supplier base
- Companies should have a homogeneous view of its purchasing processes

Hence, in a *long-term* horizon companies are recommended to focus on categorizing their indirect purchases, striving to have a process oriented purchasing organization and focus on implementation of an ERP system.

Second, a Supplier Evaluation Model is developed. This model takes the strategic importance of the purchase and the supplier relationship into consideration. Hence, it is stated that long-term relationships with suppliers not are conducted with strategic suppliers exclusively. The model has four scenarios for how to evaluate the supplier based on the importance and type of relationship.

As a *short-term action plan*, which increases the effectiveness of supplier evaluation, companies should:

1. Categorize their purchases according to Kraljic's purchasing portfolio matrix in order to define the strategic importance.
2. Decide whether to have long-term or short-term relationship with the supplier.
3. Evaluate the supplier according to the supplier evaluation model, which defines four different scenarios depending on point 1 and 2.

Key words:

Supplier Evaluation, ERP system, Purchasing, Critical Success Factors, Indirect Material

Preface

This master thesis has been conducted in cooperation with IBM Global Business Services. From the beginning the purpose of the study was not specified. We had the opportunity to develop the topic together with our supervisors at IBM. To develop this master thesis and come up with a result has been very instructive and challenging.

We would like to thank our supervisors, Patrik Andersson and Paul Thomason, at IBM for their help during this study. They have given us the opportunity to perform this master thesis and helped us to come up with new ideas how to reach our target. We would also like to thank other co-workers at IBM for their help and kindness.

We would like to thank our supervisors at Lund University, Robert Lindroth and Carl-Henric Nilsson, for their feedback and time. They have helped us when uncertainties have occurred and when we lost focus.

We would like to thank co-workers at Sony Ericsson and Tetra Pak whom we interviewed. They allocated time for our interviews and made this master thesis possible to fulfil, for which we are very grateful.

Finally, we would like to thank each other for good cooperation and hard work.

Therese and Lisa
May 2007

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1 Introduction

In this chapter, the subject and background of the master thesis is presented. Furthermore, the purpose and problem discussion is introduced to the reader. The chapter ends with definitions of the key terms which are intended to facilitate the forthcoming reading.

1.1 Background

1.1.1 The New Role of Purchasing

The purchasing process has become an important topic for companies in the past years. Previous studies¹ show that improvement in the purchasing process generates quantifiable business benefits such as lower operating costs, higher ROI and so forth, leading to competitive advantages. When investing in purchasing, companies show to achieve up to 133 percent of greater return on investment when conducting a superior purchasing process compared to regular companies². Earlier, purchasing was an operational activity focusing on achieving the cheapest prices and supplying the production with material. Therefore, companies wanted to find the best prices for a short period of time and keep a wide-ranging supplier base. Due to different factors, which are discussed below, the purchase situation has changed rapidly. Today purchasing and supplier relationships are strategic questions for companies and focus has changed from products to supplier capabilities.³

Increased Outsourcing

The trend among companies, in all kinds of industries, is to buy more from suppliers instead of making it in-house. This increased tendency of outsourcing has led to a changing role of purchasing and companies are focusing on their core competence.⁴ Therefore the importance of good supplier relationships has increased. As a result a greater part of the companies' costs are related to purchasing costs and supplier involvements in the business become a common phenomenon.⁵

Consumer Requirements

Consumer demands have changed over time and have become more individual and specific. Nowadays, the value of a product or service is not only judged after price and quality but also by convenience of purchase, after-sales services, dependability, uniqueness, etc. Therefore the consumer has the power and it is important for companies to have a flexible supply chain to fulfill the consumers' varying requirements. This can cause increasing costs for companies and the need to continuously look for opportunities for cost-cuttings have become important, which in turn affect the purchasing process.⁶

¹ Quinn, F (2005) p. 6-8

² Ibid, p. 6-8

³ Schary, P. and Skjøtt, T. (2001) p. 177

⁴ Ibid, p. 180

⁵ van Weele, A. (2002) p. 4

⁶ Ibid, p. 7-8

Ethical Issues

Customers have started to pay attention to environmental effects. This makes it important to have a good knowledge of how, where and what companies buy from their suppliers. Hence, environmental aspects have also become an important issue when evaluating the suppliers, and environmental certifications are more widespread.⁷ Other ethical issues considered important are children's labor, working hours for labor and general working environment.

Information Technology and Globalization

Due to the rapid development in information and communication technology, the world has become more accessible and automated processes have made the purchasing processes more efficient. New possibilities, such as e-procurement, make it possible for companies to find suppliers worldwide which in turn cause companies to be more cost sensitive due to the international competition.⁸

1.1.2 Purchasing of Indirect Material

Lately, companies have realised the importance of new conditions, and an adjustment of the purchasing process has started. However, focus has been on *direct* material purchasing.⁹ Purchasing of direct material can be defined as all purchases related to the end product, e.g. raw material used in the manufacturing process of a finished product. On the contrary, purchasing of indirect material can be defined as purchasing of products or services that are not related to the end product, e.g. services for maintenance, repair and operations (MRO).¹⁰

In previous studies it is stated that purchase of *indirect* material represent approximately 25% of the manufacturing company's total amount of expenses, see Figure 1. Hence, indirect material has become a more interesting issue for companies due to big opportunities to cut costs.

⁷ Schary, P. and Skjøtt, T. (2001), p. 182

⁸ van Weele, A. (2002) p. 6

⁹ Andersson, P. (22-01-2007)

¹⁰ Puschmann, P., Rainer, A. (2005) p. 122

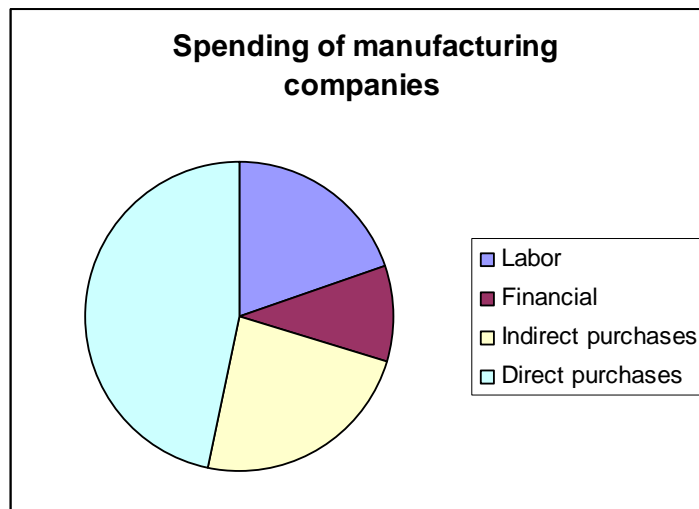


Figure 1 Spending of manufacturing companies¹¹

1.2 Problem Discussion

Long-term relationships with suppliers are getting more common. This in turn requires a better knowledge of the suppliers' performance. Hence, supplier evaluation becomes a mandatory area in the purchasing process. The ever-developing environment will no longer allow companies to base the supplier evaluation only on the cost level. Due to the aspects discussed above, an increasing number of factors determine whether a supplier is sufficient or not. Key Performance Indicators, except the cost level, that might have to be considered in today's supplier evaluation are environmental effect, level of partnership and quality. Added to this, the effects of the globalization are important. Information technology enables companies to collaborate from different continents and to contract suppliers worldwide.

Even though supplier relationships have become more important, it is time-consuming to evaluate all suppliers. Therefore, it is important to decide which of the suppliers to put an extra effort on. Also, should all suppliers be evaluated in the same way? To stay competitive on the market the company has to make the right decisions and measure their suppliers in the right way, to be precise, improve the company's *effectiveness* within supplier evaluation.

Companies tend to invest in different ERP systems, such as SAP, in order to improve the *efficiency* of purchasing activities. However, will the company translate their strategies into the ERP system in an appropriate way?

¹¹ Kapoor, V., Gupta, A. (1997) p.21-22

1.3 Purpose

The purpose of this master thesis is to determine the requirements to perform an effective supplier evaluation of indirect purchasing and critically examine in what ways companies can use an ERP system as a tool to improve the efficiency of the evaluation process. Furthermore, the purpose is to develop a supplier evaluation model, which can be used as a framework when evaluating suppliers.

1.4 Principal Company

IBM Global Business Services (GBS) is the principal company supervising this master thesis. GBS is one of four Business Units within IBM, which provides business consulting services and is one of the world's largest consulting organizations¹². To keep their market share and stay competitive, it is important for GBS to be innovative and always be ahead of their customers and competitors.¹³

1.5 Focus and Delimitations

This master thesis will focus on evaluation of companies' *existing* suppliers. This is an important area for most companies and such a scope will therefore create great value for IBM consultants as well as for IBM's clients. The study only includes manufacturing companies using SAP as their ERP System and will only analyze suppliers of *indirect material* on a *global basis*. The benchmarking study will only be done at two companies but will be the basis for a general analysis. No implementation of the findings will be done at the benchmarking companies.

1.6 Target Group

The target group for this master thesis primary include the principal company IBM and fellow students at Technology Management. In addition, employees within the Purchasing organization at Tetra Pak and Sony Ericsson are considered being primary stakeholders.

Since the conclusions are considered being general other companies interested in supplier evaluations connected to ERP systems can be seen as a secondary target group.

¹² <http://www-5.ibm.com/services/se/bcs/?trac=L1> (18-01-2007)

¹³ Thomason, P. (18-01-2007)

1.7 Definitions

Maverick buy – “share of the purchasing volume that is bought without a contract (often a considerable share of the total purchasing expenditure).”¹⁴

Procurement – “relates to the function of purchasing inputs used in the firm’s value chain.”¹⁵

Purchasing – “obtaining from external sources all goods, services, capabilities and knowledge which are necessary for running, maintaining and managing the company’s primary and support activities at the most favourable conditions.”¹⁶

Supplier evaluation – evaluation of an existing supplier in order to measure if the expectations are fulfilled.

Total Cost of Ownership (TCO) – “a purchasing concept to recognize the true cost of buying a particular good or service from a particular supplier.”¹⁷

¹⁴ van Weele (2002) p. 178

¹⁵ Ibid, p. 11

¹⁶ Ibid, p. 14

¹⁷ Schary, P., Skjøtt, T. (2001), p. 204

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2 Methodology

Initially, an overview of the working method is presented. Also, a motivation to the line of action is discussed. The overall process is based on the benchmark methodology, which is detailed described.

2.1 Working Method

In this section the sequence of work in this master thesis is described, see Figure 2.

Initiate Purpose and Conduct Project Plan

At an early stage the purpose was initiated and a project plan was conducted. This project plan was developed to secure that the authors and the supervisors, at IBM and at the University, had the same expectations of the master thesis. This step included to specify the different parts of the master thesis and to make a time schedule of when the different parts should be completed.

Methodology

When the purpose and project plan were completed, the methodology was specified and functioned as a framework for how this master thesis should be performed. When the literature studies and the empirical study were conducted, the methodology was refined to match the actual methodology.

Literature Study

The theory base for this master thesis was mainly collected from books, articles and reports. By searching on the Lund University database, ELIN, the sources were considered as trustworthy. Research from several different authors was taken into consideration when writing every main theory section. This broad approach made a high quality theoretical framework. During the literature studies researchers at Lund University, Copenhagen Business School and Stockholm School of Economics were consulted in order to find relevant literature.

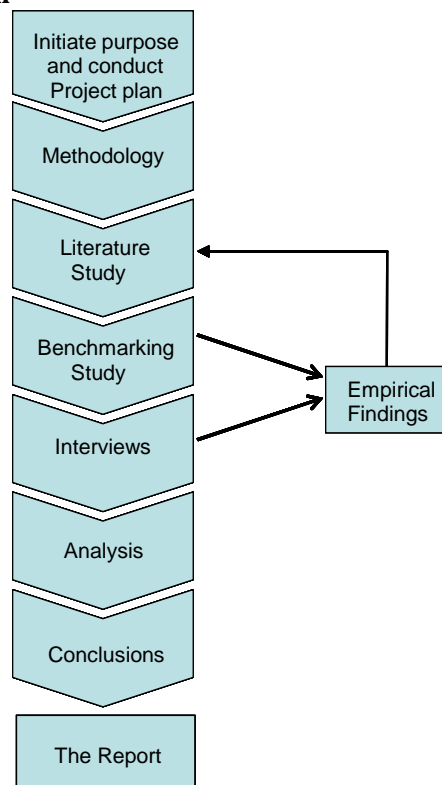


Figure 2 Working Method

Benchmarking Study

The benchmarking study in this master thesis investigated two different companies, Sony Ericsson and Tetra Pak. These companies are not in the same industry but both are global companies with a large number of suppliers. These companies are also collaborating with IBM Global Business Services, which simplified the access to the empirical data.

Interviews

The interviews followed a semi structured approach and an interview guide was used as a support during the interviews. Before compiling the interview guide research for relevant theoretical framework was done. The interviews consisted of open questions and were performed in a semi structured manner.

Analysis

When performing the analysis, the theoretical framework was compared with the empirical findings from the interviews at Sony Ericsson and Tetra Pak. Also, the two companies investigated were compared in order to conclude similarities in the manufacturing industry. Furthermore, a supplier evaluation model was developed.

Conclusion

In the conclusion the key findings from the analysis section are presented and highlighted.

2.2 Methodological Approach

When approaching the scope defined for this master thesis the “Three nodes of research”¹⁸-pyramid functioned as a guideline for the structure, see Figure 3. The three nodes, Paradigm, Methodology and Problem/research question, were all considered to be necessary to take into account with the intention of leaving no part of the work to be a happenstance. Also, in order to perform a high-quality master thesis a fit between the three nodes were of importance since there is a close relation between them.

¹⁸ Nilsson, C-H (1994) p. 1

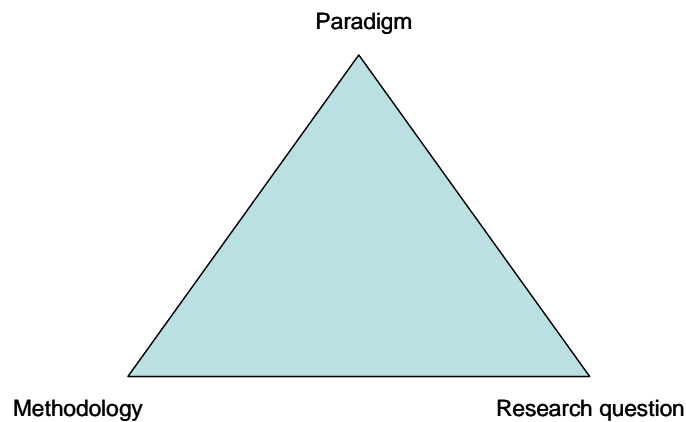


Figure 3 Three nodes of research¹⁹

A Paradigm describes the initial assumptions of reality and knowledge for the research.²⁰ In order to avoid misunderstandings and confusions in the forthcoming work, a clarification of some basic assumptions was required. Paradigms are widely discussed and categorized in previous studies²¹ within the science of methodology, often on a quite abstract level. Assumptions are mainly made on a macro level, explicitly about the world and the human beings' ability to stay objective. When to decide what paradigm to rely on, it is important to consider the nature of the *Research question*; what are the expected outcomes of the study?²²

This study focused on the System theoretical paradigm. The basic assumption of the System theoretical paradigm is an objective reality with synergistic effects.²³ When relating these assumptions on the research question for this master thesis an alignment was found. The complexity of a system requires that not only one part of the system is being studied, but as well how different parts interrelate. Also, for the same reason more than one persons view must be considered when analyzing the system.²⁴ With this in mind this master thesis was analyzed on a strategic and an operative level. We intended to map the companies' purchasing processes in order to get an understanding of their purchasing organization and purchasing goals. Hence, we found it necessary to interview persons with different areas of responsibility at Sony Ericsson and Tetra Pak. Interviews were held with approximately five persons at each company, in order to get a more accurate understanding of the system. In addition, we made interviews with the purchasing manager at IBM learn more about industrial purchasing. In some meanings also the Interpretive paradigm was applicable for this research question. "*Reality is assumed to be a social construction which is depended on the actors.*"²⁵ It is hard to argue against the fact that persons interviewed in this study to some extent

¹⁹ Nilsson, C-H (1994) p. 1

²⁰ Ibid, p. 1

²¹ Gephart, R (1999) p. 2-3

²² Nilsson, C-H (1994) p. 8-9

²³ Ibid, p. 8-9

²⁴ Arbner, I., Bjerke, B. (1994) p. 125-128

²⁵ Nilsson, C-H (1994) p. 8

have a subjective opinion on the questions asked. During the empirical study this apprehension was clear. Regarding many aspects the interviewees diverged in their answers, even when asking questions where only short answers based on fact was required.

Regarding the *methodology*, this master thesis primary had a qualitative approach. The qualitative approach aligns with the System theoretical paradigm and gives an understanding for consistency²⁶. Also, qualitative studies require an open mindset; unexpected findings during research might change the researchers' knowledge and in that case the theoretical framework is required to be reconsidered and updated. Furthermore, the qualitative methodology focuses on underlying reasons and personal opinions within the research area.²⁷ The qualitative methodology usually has an inductive aim. Theories are to be developed from the empirical findings in the specific research.²⁸ In order to get a deeper knowledge within the research field the empirical findings were based upon some more detailed interviews at two companies only. Also, during the research, it showed that some parts of the theoretical framework had to be dismissed due to some unexpected findings.

2.3 Benchmarking Study

To fulfil the purpose of this study, we have practically followed the methodology of benchmarking. Benchmarking was considered being a suitable methodology for the purpose of this study, since a comparison between Sony Ericsson and Tetra Pak was conducted.

2.3.1 Definition

Benchmarking is a methodology used to improve an activity within an organization and can be defined as:

*"...a process continually describing and comparing the company's processes with similar processes in best-in-class companies to get information that can help the company to find and implement improvements"*²⁹

Benchmarking describes the differences in performance that is, a gap between the company's activities and best practice. Despite the discovering the gap it is important to analyze how to fill it. Thus, benchmarking is a methodology that not only describes *what* to do, but also *how* to do it.³⁰ The aim of this master thesis was to identify Critical Success Factors when performing a supplier evaluation. By performing a study based on the benchmarking methodology the activities required to perform best practice can be identified. The definition of benchmarking also includes comparison with companies performing superior in the area benchmarked. However, it is not always ideal to expect that all companies can reach best practice. The main purpose

²⁶ Holme, I., Solvang, B (1996) p. 78-80

²⁷ Ibid, p. 78-80

²⁸ Bryman, A, Bell, E (2005) p. 25, 588-591

²⁹ Andersen, B., Pettersen, G. (1997) p. 11

³⁰ Karlöf, B. (1997) p. 58-59

with benchmarking is to *improve* activities in the company, however, if a company have excessively high goals this aim can complicate changes in the organization.³¹ The methodology used in this master thesis differs from the benchmarking methodology. Best practice is initially not defined, neither are the companies studied defined as actors performing a supplier evaluation best in their class. Still, conducting a study based on the methodology of benchmark was considered being relevant since improvement in performance can be identified anyhow.

2.3.2 Types of Benchmarking

There are mainly four types of benchmarking:³²

1. *Internal benchmarking* – comparing internal processes, e.g. different divisions or countries.
2. *Competitive benchmarking* – comparison with competitors on the market.
3. *Functional benchmarking* – comparing of similar processes within an industry organization and also against customers and suppliers.
4. *General benchmarking* – comparing of similar processes in other industries.

In this master thesis the supplier evaluation process in two companies from different industries were compared and a *general benchmarking* approach was performed. Supplier evaluation is a general process that is not specific for different industries and therefore two companies with a global organization was chosen.

2.3.3 The Benchmarking Process

A benchmarking process can be described in different ways depending on different literature. In this master thesis the “Benchmarking wheel”³³ was followed. The reason to choose this model was twofold. Like to this study, the model does not focus on defining best practice in an initial phase. The Benchmarking wheel consists of five phases:³⁴

1. *Planning* – choose benchmarking process, create benchmarking team, understand the benchmarking process and develop Key Performance Indicators for the benchmarking process.
2. *Searching* – develop a listing with requirements for the benchmarking partners, identify possible benchmarking partners, compare and choose benchmarking partners and establish a contact with them.
3. *Observing* – identify needs and sources of information, choose methodology and tools for collecting data and then understand the partners’ processes.
4. *Analyzing* – sort and control quality of collected data, identify performance gaps and find reasons to the gaps.
5. *Conforming* – choose best practice and fulfil performance gaps

³¹ Karlöf, B. (1997) p. 45

³² Camp, R. (1993) p. 61-65

³³ Andersen, B., Pettersen, G. (1997) p. 29

³⁴ Ibid, p. 29

Planning

When planning a benchmark the company need to decide what process they want to benchmark. A good benchmarking is performed when the company is identifying KPIs within the company and the processes related to these.³⁵ In this master thesis the process was chosen on the basis of one of the main functions in companies, the purchasing function. In an early stage the importance of suppliers and the relationship to suppliers was discerned and therefore the supplier evaluation process was considered to be important. In this study, the benchmarking team consists of the authors of the master thesis since the study not was initiated by a company. This is not in line with the methodology described in the theoretical benchmarking process. By creating a theoretical framework, the authors achieved a good insight in the supplier evaluation process and could also develop KPIs for the comparison.

Searching

Different aspects were taken into consideration when choosing benchmarking companies. Since the purpose of this research was to identify critical success factors, the authors did not know the definition of best practice from the beginning. Therefore the partners chosen, Sony Ericsson and Tetra Pak, were not considered to be best in class. The main requirement was to find partners that were global and had a wide-range supplier base but also had long-term relationships with their suppliers. To be able to get the right information and good access to the partners, collaborating companies to IBM Global Business Services were identified. Furthermore, companies using an ERP system were of interest since the investigation included issues related to ERP systems.

Observing

During the company observations all specific processes are to be mapped and the high performance enablers should be defined. Furthermore, the gap between the best practice company and the benchmarking company should be compared and understood.³⁶ Hence, the methodology used in this study differ from the one defined in the literature. This is due to the lack of a best practice definition. Instead focus was on mapping the explicit purchasing processes in order to get a deep understanding of the underlying drivers of the supplier evaluation.

Analyzing

When analyzing the information collected, the information needs to be structured. The empirical data should be comparable in order to be able to analyse the differences between the companies.³⁷ In this study some main differences between the companies were identified and analyzed in line with this methodology.

³⁵ Andersen, B., Pettersen, G. (1997) p. 38

³⁶ Ibid, p. 76-79

³⁷ Ibid, p. 96-103

Conforming

The last step in the benchmark wheel is conforming the findings to the benchmarking company and its processes.³⁸ Since no benchmark company exist in this study, interesting findings from the previous steps were considered instead when building a new supplier evaluation model. The model aims to function as a guide for companies, who want to perform a superior supplier evaluation.

2.4 Theoretical Framework

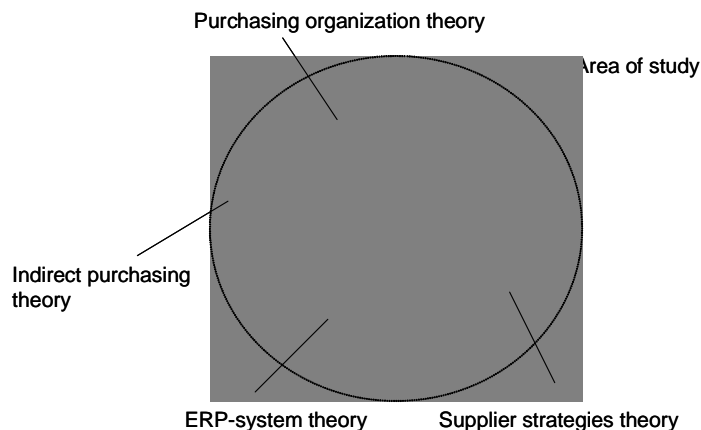


Figure 4 Theoretical framework³⁹

To answer the purpose of this study, a theoretical framework consisting of three main research areas was composed, see Figure 4. The arrow in the figure points out the specific research area of this study. First, to determine the underlying factors of successful purchasing, we considered organizational aspects being interesting to investigate. This section includes organization theory and research about categorization of indirect purchasing. Second, in order to perform a superior supplier evaluation, it was essential to take supplier strategies into consideration. The supplier evaluation must be in line with the companies' predetermined purchasing goals and, hence, purchasing strategies were regarded as an interesting area to study. Third, since the purpose incorporates implementation of ERP-systems, theories about this phenomenon are presented. We found it interesting to mix information technology theories with traditional economy theories. As the study focuses on purchasing of indirect material, theories of indirect purchasing constitutes the base of the theoretical framework.

2.5 Collecting Data

2.5.1 Primary Data

The empirical data in this master thesis was mainly collected from interviews. An interview can be structured or unstructured depending on what kind of study it is. The

³⁸ Andersen, B., Pettersen, G. (1997) p. 118-120

³⁹ The authors own construction

purpose of a structured interview is to get relevant answers from all interviews and hence very specific interview guides are used⁴⁰. Unstructured interviews are more general and the interviewer only specifies themes for the interview⁴¹. For this master thesis a semi-structured interview method was chosen. A semi-structured interview is a mix of the two mentioned and an interview guide is often used, though resulting questions in addition to this can be questioned and the order of the questions can be changed along the interview⁴². Since the empirical research in this master thesis mainly was based on interviews, a semi-structured method was chosen for getting specific answers but also to get a general view of the companies. This made the interviews flexible and when interesting topics appeared, follow-up questions was enquired.

An interview investigation can be performed in many different ways, and it is therefore preferable to choose a method from the beginning. A number of questions were considered before the interviews were held;⁴³ How many interviews will be needed? How should the interviews be analyzed? Should the interpretations be given to the interviewee?

For the purpose of this study, approximately five interviews per company were considered to be sufficient. The interviews were mainly held face-to-face. To cover different aspects of the purchasing function, people with different job roles were interviewed. The interview guide used during the interviews was put together parallel to the theoretical studies, see Appendix. The reason was to secure that no theoretical aspects relevant for this project were missed. The questions in the interview guide were open. Open questions allow the interviewee to answer more freely and she/he does not have to choose a specific answer, which is the case when using closed questions⁴⁴.

To avoid getting excessively narrow interviews, the interview guides were not sent to the interview objects in advance, unless specifically asked for. Instead, the interview session started with a presentation of the research background, problem discussion and purpose in order to let the interviewee get an insight and prepare before answering the questions.

2.5.2 Secondary Data

Little secondary data was collected in this study; focus was on the primary data collection. However, the main part of secondary data was collected from the benchmarking companies' homepages in order to get a brief overview of the companies studied.

⁴⁰ Bryman, A., Bell, E. (2005) p.135

⁴¹ Ibid, p. 138

⁴² Ibid, p. 363

⁴³ Kvale, S. (1996) p. 84

⁴⁴ Bryman, A., Bell, E. (2005) p. 176

2.6 Methods for Analysis

Before analyzing the collected data it has to be structured in an appropriate way. Opinions from the different sources should be organized in some main areas in order to achieve an overview of the material.⁴⁵ The theoretical framework constitutes the base for analyzing the data from the empirical findings.⁴⁶ When structuring the empirical findings, some main areas of interest were identified. The empirical findings were compared and analyzed from a theoretical point of view. The analysis was also based on a comparison of the companies studied.

2.7 Source Criticism

2.7.1 Reliability

One definition of reliability is “*the absence of random errors in measurement*”⁴⁷. When having a high reliability the single measurement will not be dependent on who is performing the research.⁴⁸ There are different opinions of the relevance of striving for a high reliability when having a qualitative research approach. One view is that when doing a qualitative research it is of great importance to focus on personal opinions and therefore reliability is impossible to achieve.⁴⁹ The other view is that reliability and validity (validity will be described in section 2.7.2) are closely related to each other and in order to secure validity, a high reliability must be carried out.⁵⁰ However, a solution to the inability of achieving reliability in qualitative studies is to adjust the definition of reliability to fit the new circumstances. The expression Dependability is sometimes being used for this instance. Dependability can be improved by, for example, letting an external co-worker review the research on a regular basis⁵¹.

For this research the dependability was provided by having both of the authors present at each interview. Hence all interviews were held in similar conditions. In addition the interview objects were contacted afterwards and proofread the compile from the interviews. Comments were taken into consideration and improved the reliability of the empirical context. Also, after 50 percent of the study was completed an external opponent group read the thesis and gave feedback, which was considered when continuing the work.

⁴⁵ Holme, I; Solvang, B (1997) p. 139-141

⁴⁶ Björklund, M; Paulsson, U. (2003) p. 47

⁴⁷ Lundahl, U; Skärvad, P (1999) p. 152

⁴⁸ Ibid, p. 152

⁴⁹ Bryman, A, Bell, E (2005) p. 304-306

⁵⁰ Lundahl, U; Skärvad, P (1999) p. 152

⁵¹ Bryman, A, Bell, E (2005) p. 304-309

2.7.2 Validity

Validity is about measuring what is intended to measure.⁵² To facilitate high validity it is necessary to have an alignment between the theoretical defined variable and how the variable is used on an operational level in the research work⁵³. In other words, validity can be described as the aim to measure what is supposed to be measured⁵⁴. If the validity is not fulfilled it does not matter if the research has a high reliability, since the research question is not being answered.⁵⁵ However, it is not possible to accomplish a total validity. Hence, instead it is required to have an awareness of the areas where validity not will be able to achieve. Also, the information given from the interviewees need to be critically evaluated since individuals may have a hidden agenda.⁵⁶ In order to achieve a high validity focus was laid on making clarifications of important areas. As an example a number of key expressions were initially defined in order to get all stakeholders a common understanding of the expression. The critical part when using open questions is to interpret the answers correctly⁵⁷. Both of the authors participated in the interviews, and by discussing the answers the risks for misunderstandings decreased and thus improved the validity. Also, the same interview questions were asked at all interviews in order to secure that no misunderstandings occurred. Furthermore, by having external supervisors from the University as well as the principal company, who continuously questioned the work, the authors always had to defend the work.

2.7.3 Objectivity

Staying objective was a focus area when writing this master thesis. One challenge that occurred was to keep the critical thinking during the research work. For the principal company a conclusion that verified the importance of supplier evaluation supported by a SRM system was of great interest. This knowledge could have had a negative influence on the study, since the authors in some way wanted to satisfy the principal company. By having supervisors from the University with a critical view of this issue the risk was considered small.

⁵² Holme, I., Solvang, B (1997) p. 167-169

⁵³ Ibid, p. 167-169

⁵⁴ Lundahl, U., Skärvad, P (1999) p.150-151

⁵⁵ Holme, I., Solvang, B (1997) p. 167-169

⁵⁶ Lundahl, U; Skärvad, P (1999) p.150-151

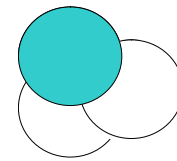
⁵⁷ Bryman, A., Bell, E. (2005) p. 177

3 Theoretical Study

The theoretical framework consists of different parts describing the purchasing organization, ERP systems, purchasing strategies and Key Performance Indicators. The theoretical framework will work as a support for the following chapters.

3.1 Purchasing Organizations and Categorizations

In order to implement a successful strategy, it is fundamental to consider how the company should be organized. Henry Mintzberg’s definition of an organization is: “Every organized human activity – from making pots to placing the man on the moon – gives rise to two fundamental and opposing requirements: the division of labor into various tasks, and the coordination of these tasks to accomplish the activity”.⁵⁸ Traditionally, organizations have been structured after the activities of finance, operations, and marketing. However, those organizations have missed the importance of the logistics activities.⁵⁹



3.1.1 Different Purchasing Organization Structures

Companies can structure the purchasing organization in various ways. Here a number of alternatives available for multi-unit companies are presented:

Centralized Structure

A centralized structure, see Figure 5, is characterized by a central purchasing organization in close relation with the corporate level. Decisions, considering product specifications and supplier selections, are made centrally. If several business units buy the same products within the company, this structure is preferable.⁶⁰

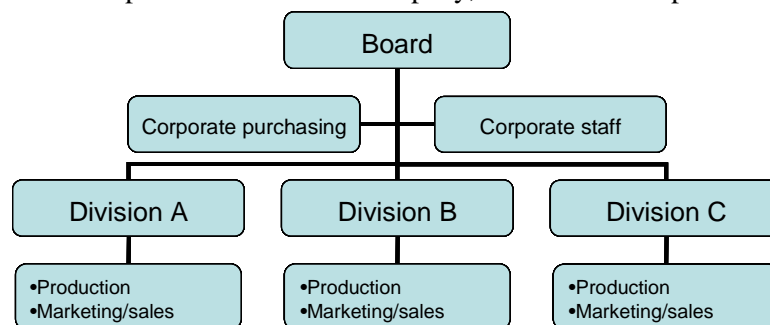


Figure 5 Centralized purchasing organization structure⁶¹

⁵⁸ Grant, R. (2005) p. 187-192

⁵⁹ Ballou, R. (2004) p. 692-693

⁶⁰ van Weele, A. (2002) p. 238-244

⁶¹ Ibid, p. 238-244

Decentralized Purchasing Structure

A decentralized purchasing organization is often used by companies with a business-unit structure, see Figure 6. This structure is characterized by business-unit managers that are responsible for their own financial results within each business-unit. Therefore each manager is fully responsible for his/her own purchasing activities.⁶²

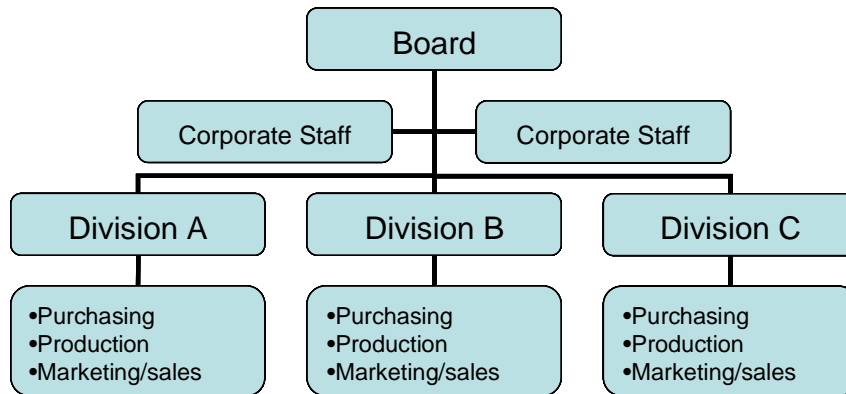


Figure 6 Decentralized purchasing organization structure⁶³

Process Oriented Organizations⁶⁴

In its initial approach, the process oriented organization differs from the centralized oriented organization described above. The process organization is defined as a structure of value adding processes. The structure is not always an uncomplicated left-to-right flowchart. It is common that the process organization consists of a complex network of processes linked together, see Figure 7.

Working in a process oriented organization; every co-worker will focus on the way that he or she is adding value to the company, rather than his/her actual position in the organization chart. In a process oriented organization, the functions characterizing a centralized organization are replaced with competence and resource centres. Regarding the operative work, it is based on cross-competence teams. In a process organization it is considered being mandatory to work in teams. That is, due to achieve an overview of the processes persons with different competences have to attend to the team. Also, multiple competences are considered adding high effectiveness to the work. In order to get an understanding of how their work will impact the overall company, teams in a process organization have a goal oriented working method.⁶⁵

⁶² van Weele, A. (2002) p. 238-244

⁶³ Ibid, p. 238-244

⁶⁴ Ljungberg, A., Larsson, E (2001) p. 89-91

⁶⁵ Ibid, (2001) p. 89-91

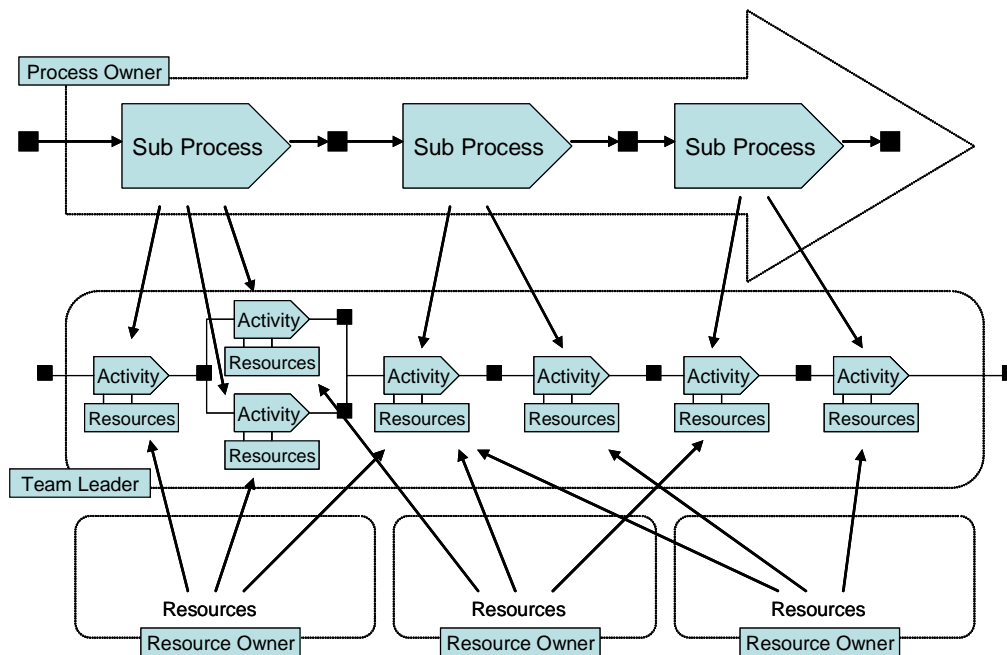


Figure 7 Process organization structure⁶⁶

3.1.2 Choice of Purchasing Organization Structure

A common issue is to choose between a centralized and a decentralized purchasing organization structure. The positive aspects to choose a centralized structure is primarily the consolidation possibilities which enables a stronger negotiation power and increased efficiency regarding resource utilization. A decentralized purchasing organization structure is advantageous when the purchasing is integrated with a certain production unit and there is no meaning of purchases on a central level.⁶⁷ However, the most common structure is to mix a centralized and decentralized organization structure. A combination enables to gain benefits from the best feature and at the same time avoid the disadvantages.⁶⁸

There are several criteria to consider when choosing an appropriate organization.⁶⁹

- *Commonality of purchase requirements* – a centralized structured is preferred when to purchase commonality products.
- *Geographic location* – e.g. cultural aspects can lead to decentralized strategies.
- *Supply market and structure* – to improve the negotiation power a centralized structure can be advantageous.
- *Savings potential* – if materials are sensitive to volume and therefore cost savings are possible with a centralized structure.

⁶⁶ Ljungberg, A., Larsson, E (2001) p. 94

⁶⁷ Gadde, L., Håkansson, H. (1993) p. 121-122

⁶⁸ Baily, P. et al (1998) p. 53-54

⁶⁹ van Weele, A. (2002) p. 245-246

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- *Expertise required* – if specific expertise is required, these purchases should be managed centrally.
- *Price fluctuations* – price sensitive materials make a centralized structure preferable.
- *Customers' demand* – if the customer requires a specific product, it is advantageous to have purchasing co-ordination within the company.

3.1.3 Purchasing of Direct vs. Indirect Material

Closely related to the purchasing organization structure is the purchasing classification. The classification of direct and indirect material is common in many companies. In the past, little research has been made within the strategies of indirect material purchasing.⁷⁰ Also, companies tend to consider indirect material being secondary expenses and therefore, the industrial world has focused on purchasing of direct material.⁷¹

Since a large part of the companies' expenses is related to purchases of indirect material, it ought to be further divided in groups with similar products purchased for the same purpose. When structuring indirect purchasing, Kapoor and Gupta suggest five functional clusters of indirect purchases. The clusters include Marketing & Advertising, Information Technology, Overhead, Human Resources and Business Specific see Figure 8. Each of the categories defined contains approximately 15-25% of the indirect purchases.⁷²

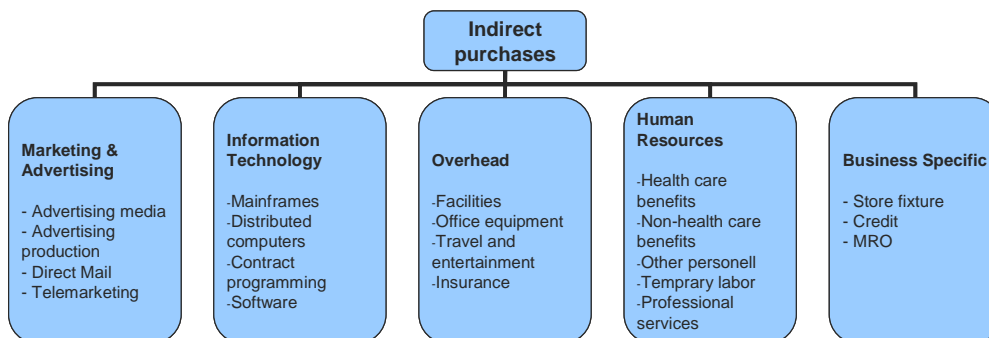


Figure 8 Indirect purchasing categorization⁷³

As mentioned above, indirect purchases tend to be poorly managed in many organizations. Kapoor and Gupta have identified three systematic problems in companies, leading to this inferior situation. First, companies have little knowledge of what they are purchasing. When lacking this basic knowledge, information about purchase volume, quality, unit cost and so forth will be missing as well. Second, indirect purchases often are negotiated without support from any formal purchasing

⁷⁰ Avery, S. (2006) p. 64-65

⁷¹ Kapoor, V., Gupta, A. (1997) p.21-22

⁷² Ibid, p.22-23

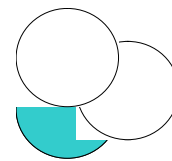
⁷³ Ibid, p.22-23

process by people without any specific negotiation skills. Third, companies do not evaluate their existing suppliers of indirect material. Instead, companies renew their existing deals with their suppliers without questioning them.⁷⁴

In order to evaluate suppliers, the strategic classification of the purchase must be determined. The strategies within each cluster of functional indirect purchasing might vary. Hence, in section 3.3.1 purchasing strategies within the purchasing portfolio field will be discussed.

3.2 Enterprise Resource Planning Systems

Enterprise Resource Planning (ERP) system is a term commonly used when talking about Business Systems. *“ERP is an industry term for the broad set of activities supported by multi-module application software that help a manufacturer or other business to manage the important parts of its business.”*⁷⁵ An ERP system integrates different business units and functions within one company so that they will work in one system. Therefore an implementation of an ERP system, to a great extent, will centralize the company.⁷⁶ Originally, ERP systems were created to support the companies’ production process. However, ERP systems are under a fast development and today they support most of the companies’ business processes.⁷⁷



When implementing an ERP system, it is important to point out that an ERP system is not only a tool making the people in the organization working more efficiently, but an entire business model. The processes supported by ERP systems are based upon best practice processes. Still many companies fail to implement the ERP system in their specific working processes. The main reason for the failure in implementing an ERP system is the gap between the company’s business processes and the processes supported by the ERP system.⁷⁸ In order to succeed in the implementation of an ERP system the company faces a challenge adapting the specific processes. Individuals within the company often require special adjustments of the ERP system in order to force it to align with their existing working methods. In turn, these adjustments can make the ERP system unstable, resulting in a system hard to maintain and run. Therefore, implementing an ERP system is much about change management. If the system is implemented in an inappropriate way no one in the organization will end up using it.⁷⁹

The benefits are great when succeeding in system implementation. Regarding the purchasing function, the benefit is the reduced number of computer systems. Instead, the ERP system becomes the one and only storage area for all information, such as

⁷⁴ Kapoor, V., Gupta, A. (1997) p. 23-25

⁷⁵ Rönnborg, P., Simson, P. (2002) p. 6

⁷⁶ Hedman, J., Kalling, T. (2002) p.193

⁷⁷ Rönnborg, P., Simson, P. (2002) p. 6

⁷⁸ Hedman, J., Kalling, T. (2002) p. 198

⁷⁹ Ibid, p. 198

purchasing orders. By avoiding having a number of different software systems unable to communicate with each other the ERP system will ease the coordination of the company. Also, by standardizing business processes, the ERP system secure that the company's different business units run the identical processes worldwide.

When using an ERP system, different techniques can be chosen in order to fit the organizations' strategies. Hence, one of the major challenges when using ERP systems is to identify the right strategy for each product⁸⁰. Traditionally, ERP systems have been implemented only on direct material, products with high transaction volumes and value-adding processes. A previous study shows that around 80 percent of all purchasing transactions are spent on indirect purchases.⁸¹ If implementing ERP systems on indirect material as well, companies can centralize the purchasing organization and, in turn, establish a preferred supplier base and control maverick buying.⁸²

3.2.1 Supply Relationship Management

Relationships between companies and suppliers are getting more complex due to globalization, shorter product life cycles and the ever growing demand from customers. In this consistency, IT needs to get more complex as well. The new communication technology, E-Procurement and, lately, Supply Relationship Management (SRM) has a relationship approach to purchasing. Until recently, ERP systems focused mainly on the company's internal processes. However, the latest development of ERP systems includes interaction with external stakeholders. The new structure of ERP systems contains separate modules such as the SRM application. The module is to be linked with the ERP system and connects purchasing activities with other areas in the company. One method of integrating the company with its suppliers is catalogue management. Purchases are made from a pre-determined catalogue, hosted by either the buyer or the supplier.⁸³ The SRM system enables an overview of the entire life cycle through integration with related areas such as design, manufacturing and production.⁸⁴ The SRM application supports companies in the following areas:⁸⁵

- Effectively manage a large part of the company's supply base
- Extend visibility into current and potential supply base
- Determine the right relationship strategies for each category and supplier
- Implement processes that support the selected category and relationship strategies across the corporation
- Enable procurement and sourcing processes and integrate interdependent processes

⁸⁰ Puschmann, P., Rainer, A. (2005) p. 126

⁸¹ Ibid, p. 126-130

⁸² Ibid, p. 126-130

⁸³ Ibid, p. 127-128

⁸⁴ Nøkkentved, C. (2004) p. 1-7

⁸⁵ Ibid, p. 6

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- Continuously monitor and measure performance across relationship
- Empower people by transforming roles, responsibilities, skills and mindsets

The Aberdeen Group has made a benchmark study with nearly 150 companies regarding e-procurement performance. Three categories of companies were defined, regarding their maturity in e-procurement competence. Variables that companies are measured on are Process, Organization, Knowledge, Technology and Performance Metrics:⁸⁶

- Laggards (30% of the companies): Practices that are significantly behind the average of the industry
- Industry Average (50% of the companies): Practices that represent the average or norm.
- Best in Class (20% of the companies): Practices that are the best currently being employed and significantly superior to the industry norm.

Companies that belong to the Best in Class category enjoy the greatest value from their technology investment. The success can be explained by some activities or strategies present in the company. For example it is important to secure that all users in the organization only purchase from preferred suppliers. That is done by spreading the new routines in the company. Also some punishment was made when users did not follow the instructions. When employers make a purchase from a non-preferred supplier they get charged a pre-determined sum and will also receive a warning letter from the CFO. Another key to success among Best in Class companies is the use of performance metrics. Parameters such as adoption and usage rate, if the suppliers are enable, etc. are measured by the companies. Furthermore, the Best in Class companies defined e-procurement as a strategic source-to-pay initiative instead of a tactical transaction activity. These companies were also more positive to investments regarding complementary procurement automation solutions and services.⁸⁷

If a successful implementation is done there are some benefits gained:⁸⁸

- *Automation* – support the automation of transactional SRM processes between an organization and its suppliers.
- *Optimization* – through enhanced dynamics, real-time analytical tools and online analytical processing tool, the optimization of processes and decision-making is supported.
- *Visibility* – information and process flows can be shared between organizations.
- *Integration* – enables a single view of the supply chain and integrates multiple departments, internally and externally.
- *Collaboration* – provide collaboration through sharing of information, internally and externally.

⁸⁶ Aberdeen group (2004) p. 1, 10-11

⁸⁷ Ibid, p. 12

⁸⁸ Nøkkentved, C. (2004) p. 9-10

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- *Flexibility* – decrease supplier dependency by providing a flexible supplier platform.
- *Adaptability* – continuously improving of processes with evolving SRM practices and technologies.

Purchasing organizations meet challenges due to a large variety of product groups, the complexity of consumption and difficult cost structures. For example, companies have to redefine their purchasing processes to achieve higher efficiency. Also, purchasing organizations can no longer work solely, but have to receive input from different specialists within the company. Hence, companies implementing a SRM system will not always benefit from the positive effects described in the section above. Some areas which inhibit the implementation of SRM systems are:⁸⁹

- Inappropriate global sourcing practices – if focus is still on finding lowest cost and regional based suppliers.
- Missing TCO perspective – if there is no understanding of total cost of ownership.
- Missing cooperation between different functions.
- Lack of procedures to ensure suppliers' capabilities and commitments.
- Not enough clarity of the roles of strategic sourcing respectively operational procurement.
- Inappropriate incentive systems.
- Missing metrics to measure non-price-related supplier qualifications.
- No visibility into enterprise spending and SRM best practices.
- Stiffness in supplier contracts and relationships.

All in all, most often this lag in value adding when implementing a SRM system is a consequence of the companies' existing working methods obstructing the implementation.⁹⁰

As mentioned above, E-procurement systems enable the companies to improve areas such as spend compliance and control. Hence, the Aberdeen group present some action points for companies in respective category in order to improve their use of their e-procurement systems.⁹¹ *Laggards* have to make executive leadership aware of the importance of e-procurement and also, spread an understanding of the impact e-procurement can offer the company. That could be done by running a project in which the strategic compliance and financial effects of e-procurement are demonstrated. Furthermore, *Laggards* should secure supplier enablement by using supplier networks and content hubs whenever possible. The last action point presented for *Laggards* is to define basic performance goals. That should be done by start doing a benchmark of existing performance in key areas and use e-procurement solutions to track these metrics. The results should be reported to business unit heads and stakeholders on a regular basis.⁹²

⁸⁹ Nøkkentved, C. (2004) p. 10-11

⁹⁰ Ibid, p. 11

⁹¹ Aberdeen group (2004) p. 16-18

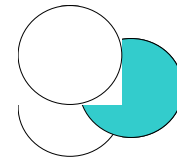
⁹² Ibid, p. 16

Action points recommended for *Industry Norm companies* is first to reframe the e-procurement project into a broader compliance initiative. That is done by investigating current rollout plan and performance and identify improvements in spend leverage and drive compliance. Second, the Industry Norm Company should adopt complementary functionalities in order to expand processes. The working method is to identify processes of how to improve spend leverage and compliance and how these processes can integrate with and complement e-procurement. Third, Industry Norm Companies should implement incentive programs to achieve business unit compliance. The incentive program should prompt business unit leadership to take an active role in driving e-procurement system adoption and spend compliance.⁹³

Best in Class companies are recommended to rethink supplier enablement and transaction management approach by considering outsourcing of managing supplier catalogs and internal transactions to a third-party network or service provider. Also, Best in Class companies should improve spend data management capabilities by start using spend data management tools or services to gain full visibility into spending. The last recommendation to best in Class companies is to employ demand management strategies, i.e. link e-procurement transactions to financial systems in order to secure that the purchases follow budget goals.⁹⁴

3.3 Supplier Strategies

Supplier strategies are related to different aspects such as number of suppliers, kind of relationship with the supplier, and so on. How to decide what strategy to use is depending on what kind of product to be purchased.⁹⁵ A good tool to use when categorizing products is portfolio models.



3.3.1 Purchasing Portfolio Models

The first model of categorizing important and less important purchases was ABC-analysis.⁹⁶ This model was only considering the financial value and not cost of poor quality, performance risk, etc. Furthermore, this model does not present strategic recommendations for the ABC-categories.⁹⁷ Since the 1980's various purchasing portfolio models have been developed and one of the first and most famous ones is Kraljic's purchasing portfolio matrix.⁹⁸ Purchasing portfolio models have become a popular tool to use, mainly because they are easy to use and understand and give practical guidelines for how to act in different purchasing situations⁹⁹.

⁹³ Aberdeen group (2004) p. 17

⁹⁴ Ibid, p. 17-18

⁹⁵ van Weele, A. (2002) p. 102

⁹⁶ Gelderman, C., van Weele, A. (2005) p. 21

⁹⁷ Ibid, p. 21

⁹⁸ Caniëls, M., Gelderman, C. (2005) p. 141

⁹⁹ Dubois, A., Pedersen, A. (2002) p.37

Kraljic identified a four stage approach for shaping the supply strategy: classification, market analysis, strategic positioning and action plans.¹⁰⁰

1. Classification

Kraljic's portfolio matrix classifies product purchase into a two-dimensional matrix considering:

- Profit impact: *"the strategic importance of purchasing in terms of the value added by product line, the percentage of raw materials in total costs and their impact on profitability"*¹⁰¹
- Supply risk: *"the complexity of the supply market gauged by supply scarcity, pace of technology and/or materials substitution, entry barriers, logistics cost or complexity, and monopoly or oligopoly conditions"*¹⁰²

This matrix consists of four quadrants that classify the products into: strategic items, leverage items, bottleneck items and routine items. Each of the categories presents different supplier strategies, see Figure 9.¹⁰³

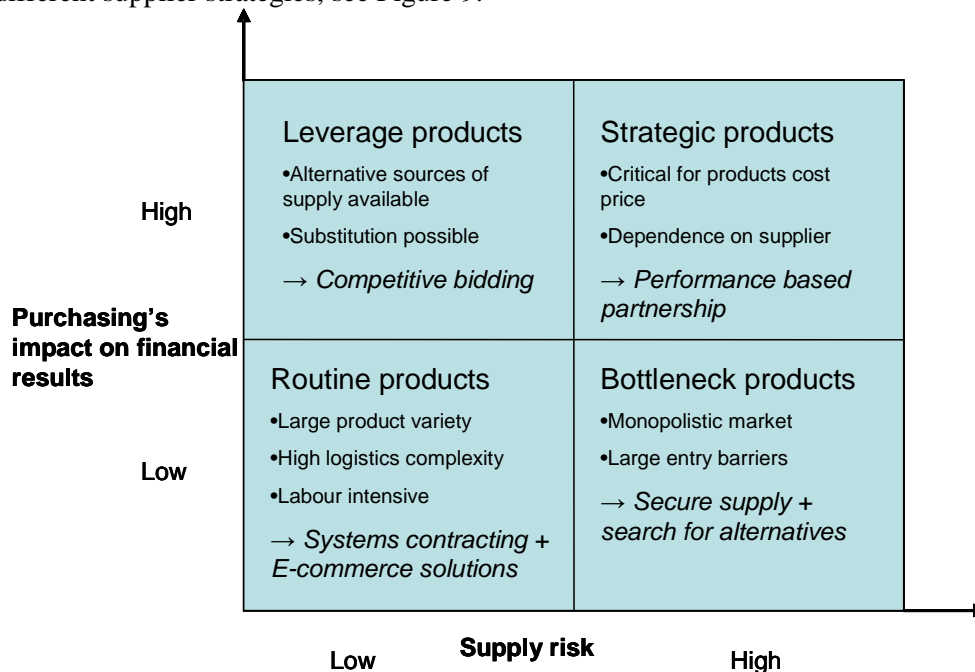


Figure 9 Kraljic's portfolio matrix¹⁰⁴

¹⁰⁰ Kraljics, P. (1983) p. 112-114

¹⁰¹ Dubois, A., Pedersen, A. (2002) p.37

¹⁰² Ibid, p.37

¹⁰³ Kraljics, P. (1983) p. 112

¹⁰⁴ van Weele, A. (2002) p. 147

2. Market Analysis

After the classification the company should weight the bargaining power of the suppliers compared to its own strength as a customer, see Table 1. This helps the company to systematically follow changes on the supplier market, considering availability of strategic material and the relative strength of existing suppliers. Then the company should analyze its own needs and supply lines in order to define an appropriate relationship.¹⁰⁵

<i>Supplier strength</i>	<i>Company strength</i>
Market size versus supplier capacity	Purchasing volume versus capacity of main units
Market growth versus capacity growth	Demand growth versus capacity growth
Capacity utilization or bottleneck risk	Capacity utilization of main units
Competitive structure	Market share vis-à-vis main competition
ROI and/or ROC	Profitability of main end products
Cost and price structure	Cost and price structure
Break-even stability	Cost of non delivery
Uniqueness of product and technological stability	Own production capability or integration depth
Entry barrier (capital and know-how requirements)	Entry cost for new sources versus cost for own production
Logistics situation	Logistic

Table 1 Purchasing portfolio evaluation criteria¹⁰⁶

3-4. Strategic Positioning and Action Plans

The materials identified as strategic in the purchasing portfolio matrix in phase one, should be positioned. In the fourth phase the strategic implications of the purchasing portfolio position is considered. Kraljic defines three strategies depending on the position: exploit, balance and diversify.¹⁰⁷ Further development done by van Weele describes various strategies for each of the four quadrants in the matrix:¹⁰⁸

- *Competitive bidding* – a competitive bidding strategy should be used for leverage products, since the suppliers and products are exchangeable. This means that short-term relationships and search for the best deal at the moment, i.e. a spot purchasing strategy, are preferred.
- *Performance-based partnership* – 80 percent of the total turnover comes from strategic products together with leverage products, which implies that a small change in price have a great impact on the end product’s cost. Furthermore, strategic products have an important role for the end product and the suppliers are important. To be able to observe price and cost

¹⁰⁵ Kraljics, P. (1983) p. 112-113

¹⁰⁶ Ibid, p. 112-113

¹⁰⁷ Ibid, p. 114

¹⁰⁸ van Weele, A. (2005) p.152-153

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changes and at the same time identify changes on the supplier market, the company should have a central or coordinated purchasing approach and create a long-term relationship with the supplier.

- *Category management and e-procurement solutions* – for routine or MRO-products a strategy for reducing administrative and logistic complexity is preferred. By developing electronic catalogs together with the supplier, employees can order directly from pre-selected suppliers and therefore the administrative efforts decrease. The relevant aspects for these products are to: standardize the product assortment, reduce the number of suppliers and pursue system contracts for categories of MRO-products, work with electronic catalogs, order through Internet-technology, electronic payment or Purchasing Card.
- *Securing continuity of supply* – for bottleneck products focus should be on securing product supply. To decrease the dependence of a specific supplier, alternative products and supplier relationship should be developed. It is also important to make a risk analysis to identify the most important bottleneck items in the short-, middle- and long-term supply. The risk analysis is the basis for a contingency plan that secures an action plan if a risk occurs, e.g. measures for stock levels.

Olsen and Ellram have further developed Kraljic's matrix into a three-step portfolio model. Their *first step* includes an analysis of the company's purchases. By mapping the purchases according to the strategic importance of the purchase and the difficulty in managing the purchase situation, the nature of the purchase will be determined. Factors influencing the strategic importance of the purchase are divided into the three subgroups, Competence, Economic and Image factors, which are internal factors, see Table 2.

Factors influencing the Strategic importance of the Purchase	
<i>Competence factors</i>	
1.	<i>The extent to which the purchase is part of the firm's core competences</i>
2.	<i>Purchase improves knowledge of buying organization</i>
3.	<i>Purchase improved technological strength of buying organization</i>
<i>Economic factors</i>	
1.	<i>Volume or dollar value of purchases</i>
2.	<i>The extent to which the purchase is part of a final product with a great value added</i>
3.	<i>The extent to which the purchase is part of a final product with a good profitability</i>

Table 2 Internal factors¹⁰⁹

¹⁰⁹ Olsen, R., Ellram, L. (1997) p. 104

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The factors describing the difficulty of managing the purchase situation, presented in Table 3, are external factors to the company. The subgroups of factors are Product characteristics, Supply market characteristics and Environmental characteristics. It is emphasized that all factors, internal and external, are optional and will vary among firms. By determining the relative importance of the different factors, the company can categorize the items in Krajlic's portfolio model.¹¹⁰

<p>Factors describing the difficulty of managing the purchase situation</p> <p><i>Product characteristics</i></p> <ol style="list-style-type: none">1. <i>Novelty</i>2. <i>Complexity</i> <p><i>Supply market characteristics</i></p> <ol style="list-style-type: none">1. <i>Suppliers' power</i>2. <i>Suppliers' technical and commercial competence</i> <p><i>Environmental characteristics</i></p> <ol style="list-style-type: none">1. <i>Risk</i>2. <i>Uncertainty</i>

Table 3 External factors¹¹¹

The *second step* in the model is to analyze the supplier relationships. Olsen and Ellram criticize Krajlic's suggestion, which is that the company should use its buying power in order to confirm its position on the market. Due to a rapidly changing market a company should not exploit its position on the market, but analyze its relative supplier attractiveness and the strength of the relationship with the supplier. Four subgroups of factors are defined, including Financial and economic, Performance, Technological and Organizational, cultural and strategic factors. In addition, one group with unspecified factors is mentioned.¹¹² The factors describing the strength of the relationship are divided into four subgroups; Economic factors, Character of relationship, Cooperation between buyer and supplier and Distance between the buyer and the supplier. These are all factors that, in one way or another, build bonds between the buyer and the supplier.¹¹³

The last step in Olsen and Ellram's three-phase model is to develop action plans based on the conclusions made in the previous two steps. If it is a product with high or moderate supplier attractiveness and low or average relationship strength, a strategy which strengthens the relationship and keeps the supplier loyal is recommended. On the other hand, if it is a product where the supplier attractiveness is low, a recommended strategy could be to replace the supplier. However, it is important to think about the supplier's influence on the company's network position. A third case, if it is a product where the suppliers has a moderate or high relative

¹¹⁰ Olsen, R., Ellram, L. (1997) p. 104

¹¹¹ Ibid, p. 104

¹¹² Ibid, p. 106-107

¹¹³ Ibid, p. 106-107

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attractiveness and a strong relationship, a strategy which reallocate resources to sustain a strong relationship is recommended. There could also be situations where there is a high degree of mismatch between the level of resources allocated and the relative supplier attractiveness. In this case, the company should develop strategies in order to improve the management of the current portfolio of the supplier relationships.¹¹⁴

A *third portfolio model*, related to buyer and supplier relationships, is suggested by Bensaou. He also defines a matrix; however, the vertical axis signifies the buyer's specific investment and the horizontal axis the supplier's specific investments. The buyer's investments related to the purchase include tangible investments such as buildings and equipment. An example of intangible investments is effort spent learning the supplier's business practices. The supplier investments follow the same tangible and intangible logic. Tangible investments will, for instance, be a new plant close to the buyer or customized dies and intangible investments in synchronized computer systems.¹¹⁵

Given the levels of specific buyer and supplier investments four categories of partnership can be defined. The categories include Strategic partnership, Market exchange, Captive buyer and Captive supplier.¹¹⁶ As seen in Figure 10, in the Strategic relationship, the purchase requires major investments for buyer and supplier, i.e. the relationship is important for both parties and the switching costs will be high. On the contrary, in the Market exchange quadrant supplier and buyer benefit from the relationship, but a switch of buyer or supplier will have little impact on any of the parties. In the two remaining types of relationships either the buyer (Captive buyer) or the supplier (Captive supplier) are to some extent dependent on the other party due to a greater relation-specific investment.¹¹⁷

¹¹⁴ Olsen, R., Ellram, L. (1997) p. 108-109

¹¹⁵ Bensaou, M. (1999) p. 2

¹¹⁶ Ibid, p. 2

¹¹⁷ Ibid, p. 2

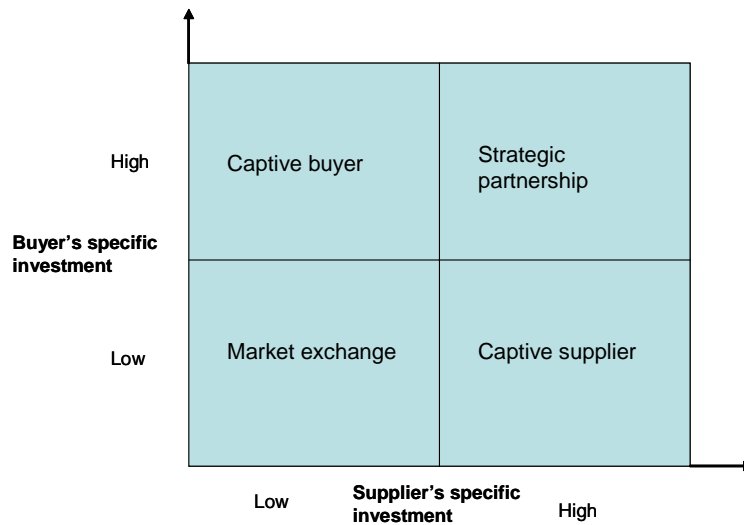


Figure 10 Bensaou's portfolio model¹¹⁸

The company's purchasing strategies will depend on the nature of the supplier-buyer relationship. In order to get a superior purchasing process, it is important that the company categorize different purchases in a sufficient way. Furthermore, the company should have an appropriate strategic approach to each category. To determine what purchases to place in which category, it is suggested to analyze complexity of the items purchased, the level of competition and capabilities of the suppliers available on the market. Goods having similar characteristics regarding these aspects should be managed in the same way.¹¹⁹

The market-exchange profile include standardized commodity products which demand little customization. In this profile it is possible to change suppliers easily. Best practice market-exchange management takes place when buyer and supplier interact only at negotiations and renewal of contracts. Most often no cooperation between the parties takes place; the product ordered is specified by the buyer and manufactured by the supplier. Also, only when problems come up the buyer visit the supplier. Even though little cooperation exists between the parties the market-exchange relationship is considered as positive.¹²⁰

Given the captive-buyer profile compared to the market-exchange profile there are few differences between the products purchased. In both cases standard products, which are little customized, based on stable technology are purchased. Instead the scarcity on the market is the main difference. That is, there are few large and strong suppliers on the market. In the captive-buyer relationship more information is

¹¹⁸ Bensaou, M. (1999) p. 3-4

¹¹⁹ Ibid, p. 3-4

¹²⁰ Ibid, p. 4-7

exchanged than in the market-exchange profile. Often the climate in the relationship is tense.¹²¹

Products purchased in the strategic-partnership profile are complex and highly customized. The market is growing fast and is characterized by high competition and an uncertainty of what standard to use. Companies often work in close relationships or partnerships with one another. The companies have good insight into one another's affairs. Also, the suppliers invest heavily in research etc. The relationship is close and information is exchanged on a regular basis and engineers from the buyer company are involved in design of for example major production systems. In some company functions, such as purchasing, firms use electronic data interchange systems in order to enable close relationship. The climate in the relationship is trusting and collaborative, however sometimes a bit tense due to different opinions regarding price and quality etc.¹²²

The captive-supplier profile includes complex products built on the latest and best technology. Suppliers have invested heavily to be able to supply the product. However, due to the high competition and fast development the buyer can shift supplier easily since another supplier soon will offer a new and higher performance product. Hence, the suppliers have little bargaining power.¹²³ Captive-supplier profile relationships will have relatively little information exchange between parties. However, the supplier will take the largest responsibility for the relationships.¹²⁴

3.3.2 Purchasing Portfolio Models Synthesis

When comparing the portfolio models presented above they somewhat differ in their initial approach. The purchasing portfolio model presented by Olsen and Ellram is a further development of the model first introduced by Kraljic. In the models the two axes of the matrix regard the importance of the purchase and the complexity of the supplier market. However, in Olsen and Ellram's version the factors impacting the strategic importance of the purchase and the factors describing the difficulty of managing the purchase situation are more detailed than in Kraljic's original model. Olsen and Ellram list categories of factors within the axis, making the model complex. Kraljic, on the other hand, lists a number of criteria, without any suggestions how to organize them when analyzing the purchase.

One weakness regarding Bensaou's portfolio model is its delimitation to have been developed from empirical findings in the automobile sector only¹²⁵. Olsen and Ellram present a portfolio model that is more general and applicable in all manufacturing industries.¹²⁶ The axes in Bensaou's portfolio model assume that the specific investments between buyer and supplier are the critical issues. This

¹²¹ Bensaou, M. (1999) p. 5-7

¹²² Ibid, p. 5-8

¹²³ Ibid, p. 6

¹²⁴ Ibid, p. 8

¹²⁵ Ibid, p. 1

¹²⁶ Olsen, R., Ellram, L. (1997) p. 104

approach is narrow since, for example, strategic partnerships by definition do not have to be related to large investments by both parts. Comparing with Olsen and Ellram which first analyze the actual *purchase*; Bensaou rather classifies the *relationship* between supplier and buyer. In the second phase Olsen and Ellram also take the relationship between buyer and supplier into account, however not only the parties investments, but also the relative supplier attractiveness.

Thus, there are some different approaches between the models and the key concerns are the relative relation between buyer and supplier and the strategic importance of the purchase. Therefore, one upcoming question is the relevance of developments of Kraljic's purchasing matrix. However, all models presented above are considered being interesting since they come up with new and relevant aspects.

3.3.3 Key Performance Indicators

In order to classify the strategic relevance of the purchase the portfolio models are used. The next step is to further consider other strategic aspects, the Key Performance Indicators (KPIs). KPIs are metrics measuring the activities most critical for the company. Does the company fulfil its strategic goals on an operative level? Also, are the quality requirements accomplished by the company? One simple definition of KPIs is "...*those things the organization must do well for its strategy to success*".¹²⁷ In order to meet the competitive market, companies should focus on these business drivers.¹²⁸

In previous research, a range of 13 to 60 parameters is used when performing a supplier selection.¹²⁹ Traditionally, parameters related to quality, cost and delivery reliability are the most commonly used when evaluating a company's suppliers.¹³⁰ In order to determine relevant parameters for the supplier evaluation it is suggested to initially group the parameters into a small number of categories. Also, it is stated that the importance of the categories tend to vary over time, which imply that the categories continuously must evolve.¹³¹

Some of the articles focus on supplier *selection* rather than on supplier *evaluation*. In this theoretical framework models for supplier selection are considered being of interest for supplier evaluation as well. In research presented by Hsu *et al.* it is stated that the company's capability of purchasing materials and services will impact the value created in the company. A company capable of identifying the supplier with the greatest ability to create value to the company will gain a competitive advantage. In order to achieve competitive advantage, not only the product and the supplier performance must be superior, but an alignment between supplier and buyer must

¹²⁷ ISA-95.00.01-2000 Enterprise-Control System Integration Part 1: Models and Terminology p. 83

¹²⁸ Ibid, p. 83

¹²⁹ Huang, S., Keskar, H. (2007) p. 511

¹³⁰ Ibid, p. 512

¹³¹ Ibid, p. 513

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exist as well. Hence, the model presented by Hsu *et al.* includes the three categories Supplier quality, Supplier service and Strategic/Management fit.¹³²

The first category, *Supplier quality*, has a wide range of definitions among articles. However, regardless of the definition it is considered being an important parameter when selecting a supplier. Parameters which indicate the supplier quality are for example Industry knowledge, Technical expertise, Supplier's process capability.¹³³

The *Supplier service* category is primarily about meeting the buyer's needs. That function is described as having two aspects. First, the supplier must respond to the buyer's demand and changes in the buyer's demand within an acceptable time horizon. Second, this must be fulfilled within the range of the buyer's cost expectations. However, in a partner relationship between buyer and supplier price becomes less important among other aspect. Hence, TCO is considered being a suitable aspect rather than the actual price. Parameters measuring supplier service are for example *Ability* to meet delivery due dates, *Flexible* contract terms and *Geographical* compatibility.¹³⁴

Strategic and management fit is the third category described in the model. Strategic fit is defined "*in terms of whether the buyer and supplier act in a unified manner toward a desired strategic goal*"¹³⁵. Management fit on the other hand is defined "*in terms of whether each entity seeks to understand the desires and goals of the other and to appreciate the situation from the other's perspective*"¹³⁶. Simplifying Strategic fit, a company carrying a high-quality and low-volume strategy should not contract a supplier focusing on large volume and low-quality. Given the Management fit, also culture and aspects similar to that should match between buyer and supplier. Previous research focuses on tangible parameters. However, it is also shown that intangible aspects have a positive impact on the buyer-supplier relationship. Examples of Strategic/management fit parameters are Open to site evaluation, Financial stability and Cultural match between companies.¹³⁷

Huang and Keskar define another model consisting of a cluster of three tracks regarding supplier performance. The model is a development of the Supply Chain Operations Reference (SCOR) model, which is considered being an industry standard model.¹³⁸ One difference between the SCOR model and Huang and Keskar's model is the three tracks layout which includes Product related parameters, Supplier related parameters and Society related parameters. The SCOR model consists of five parameter categories: Reliability, Responsiveness, Flexibility, Cost

¹³² Hsu, C. *et al.* (2006) p. 217-218

¹³³ Ibid, p. 218-221

¹³⁴ Ibid, p. 219-220

¹³⁵ Ibid, p. 220-221

¹³⁶ Ibid, p. 220-221

¹³⁷ Ibid, p. 220-221

¹³⁸ Huang, S., Keskar, H. (2006) p.513

and financial and Assets and infrastructure.¹³⁹ In the Huang and Keskar model (shown in Figure 11), two additional categories, Safety and Environmental categories are added.¹⁴⁰

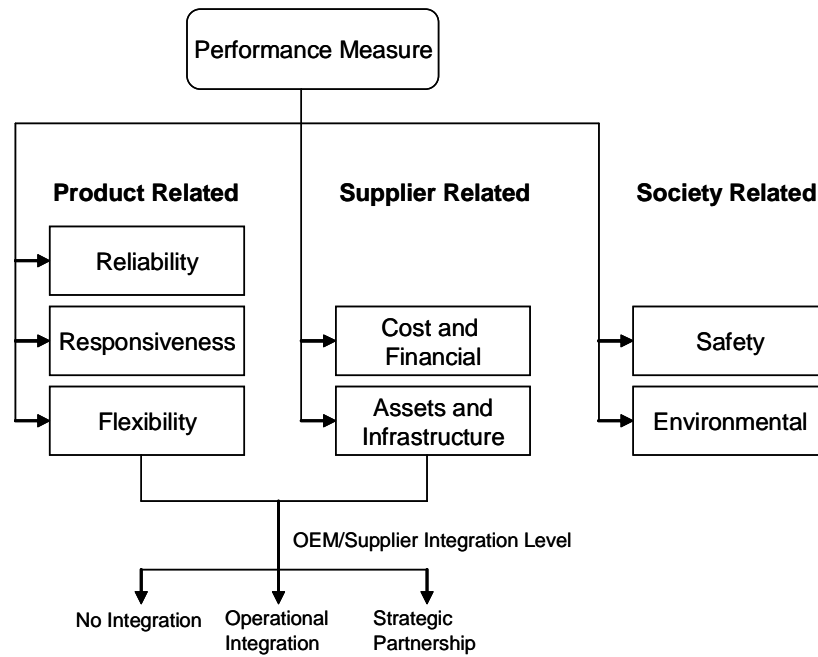


Figure 11 Hierarchy of supplier selection metrics¹⁴¹

A company is not supposed to follow the model strictly, instead the company should critically evaluate whether all categories are necessary to include in the supplier evaluation or not.

In a model presented by Chu and Fang the importance of trust and commitment in a supplier relationship is discussed. A successful supply chain is based on partnership with shared information. However, for companies to be willing to share information, a great amount of trust is required in the relationship. In a partnership where trust and commitment is strong, both parties will benefit from enhanced productivity, efficiency, effectiveness and a successfully supply chain performance¹⁴². Chu and Fang show that four underlying factors affect the trust, which in turn affects the commitment between the firms, see Figure 12. Perceived Satisfaction, Partner's Reputation and Communication all positively affect the partnership trust. Perceived Conflict, on the other hand, have a negative influence on the trust between firms.¹⁴³

¹³⁹ Supply Chain Operations Reference-model p.8

¹⁴⁰ Huang, S., Keskar, H. (2006) p.513

¹⁴¹ Ibid, p.513

¹⁴² Chu, S., Fang, W. (2006) p. 225

¹⁴³ Ibid, p. 226-228

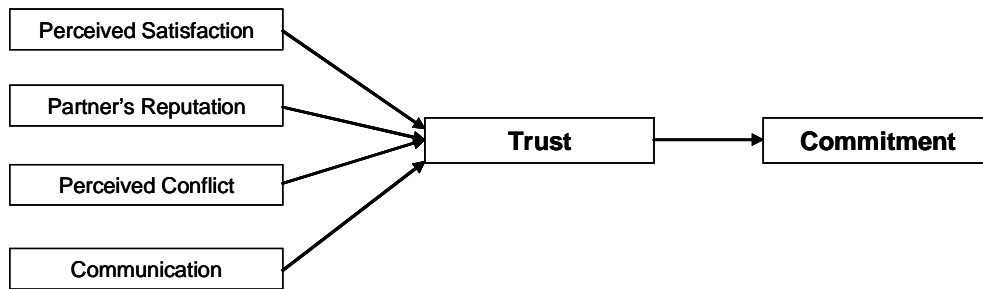


Figure 12 Evaluation criteria considering trust¹⁴⁴

3.3.4 Key Performance Indicators Synthesis

Given the models described above, quantitative as well as qualitative parameters are important when evaluating the supplier. Chu and Fang focus on trust only, which clearly is a qualitative measurement. On the contrary, Hsu *et al.* mention parameters regarding quantitative and qualitative aspects. For example KPIs such as Price and Delivery reliability can be seen as quantitative parameters. Also qualitative parameters such as supplier flexibility and technical expertise are mentioned. Huang and Keskar include another dimension regarding society related measurement. Despite this dimension, Huang and Keskar's model is in line with the categories described by Hsu *et al.*

¹⁴⁴ Chu, S., Fang, W. (2006) p. 225

4 Sony Ericsson Mobile Communications

This chapter is based on interviews with various people working at Sony Ericsson. We have chosen not to refer continuously in the text because of awareness of the interviewees' own requests.

4.1 Overview of Sony Ericsson

Sony Ericsson Mobile Communications was established in October 2001 as a joint venture between Ericsson AB and Sony Corporation. Each of the parent companies equally owns 50 % of the company. Sony Ericsson is a global provider of cell phones and cell phone accessories.¹⁴⁵ In year 2005 the company sold 74.8 million units and had an income before tax on 1,298 million Euros. Today Sony Ericsson has over 7500 employees worldwide.¹⁴⁶

4.2 Purchasing Organization and Categorization

Sony Ericsson has a global and centralized purchasing organization that is divided into direct material and indirect material. The working processes for the direct and the indirect material organizations are built up and run independently and the two organizations have put up their own internal working processes. The organization for indirect material is called Indirect Material and Services (IM&S) and has existed for three years. Before the IM&S organization was invented, purchasing of indirect material was performed decentralized. As mentioned above, the purchasing organization is managed in a centralized way. However, the operative work is conducted centrally as well as on a local basis.

At IM&S Sony Ericsson is working in six different commodity teams, namely Travelling, Marketing, IS/IT, Consultants, Test and Measurement and External services. Furthermore, the commodity teams at IM&S are divided into three levels, namely Category, Area and Product group. The first level includes the six categories named above. These categories can be further divided into different Areas in the second level as shown in Figure 13. The third level (not shown in the figure) is the Product groups within each different area. For example the area Air within category Travel is further categorized into the product groups Air fares, Tickets and Tickets overseas.

¹⁴⁵<http://www.sonyericsson.com/spg.jsp?cc=global&lc=en&ver=4001&template=pc1&zone=pc&lm=pc1> (28-02-2007)

¹⁴⁶http://www.sonyericsson.com/spg.jsp?cc=global&lc=en&ver=4001&template=pc3_1_1&zone=pc&lm=pc3&prid=7012 (08-03-2007)

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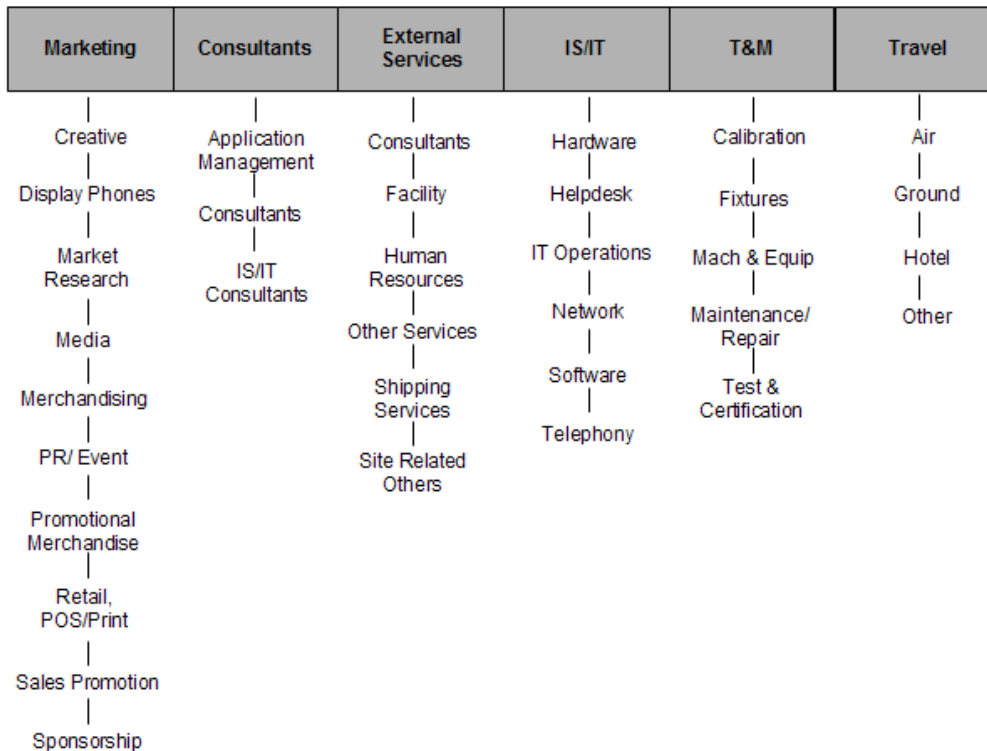


Figure 13 IM&S Organization chart¹⁴⁷

Due to Sony Ericsson’s close relationship with the parent companies, they have a superior negotiation position with their suppliers. Sony Ericsson can benefit from either one of their parent companies’ supplier contracts, except for purchases in the Marketing category. If none of the mother companies’ contracts are suitable, Sony Ericsson can choose to adjust the contracts, alternative negotiate their own ones, according to their specific preferences.

4.3 Use of ERP System

Sony Ericsson is currently using SAP R/3 as ERP system in their purchasing organization. SAP R/3 is primarily utilized when spend analysis are made. Also, SAP R/3 is used when investigating what the company has bought historically, in order to anticipate future demand etc. On a strategic level, however, SAP R/3 is not used on a daily basis; instead it is the operational buyers who are using the ERP system in their daily work. The operational buyers use SAP R/3 mainly as support for making purchase orders. Sony Ericsson has integrated their systems with the supplier through catalogs and web portals and it is mainly logistics that is using this integration when handling components.

¹⁴⁷ Internal material from Sony Ericsson

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Generally, persons interviewed consider SAP R/3 being relatively hard to utilize, due to the complexity of the system. Hence, when using the system once a week only, there is a problem for the user to get to know the system. Within the IS/IT category, data is downloaded and visualized through a software named Quick View when performing a supplier evaluation. Here, SAP R/3 is seen as an *input* system only. On the contrary, Quick View enables *output* of information from all systems available, including SAP R/3.

On the operative level SAP R/3 initially was considered being quite complex and hard to learn as well. However, after working in the system for a while it gets easier to find relevant search paths and to understand the system. Usually, only the most necessary functions are used, due to the complexity.

The persons interviewed have different opinions of the usability of SAP R/3. One advantage mentioned is that SAP enables implementation of general working processes. For example, when performing a supplier evaluation, SAP R/3 can help IM&S to work in a homogenous way. Another advantage provided by an ERP system is the ability to verify people's individual opinions. Statistics from SAP R/3 present information on an objective level.

4.4 Supplier Strategies

The process Sony Ericsson use for defining strategies is shown in Figure 14. In the beginning of the process, the purchases are categorized which is the base for the choice of purchasing strategy. Sony Ericsson use a matrix based on the Kraljic's portfolio matrix, in order to choose the right strategy for each category. The axes are defined to "Internal importance" and "Complexity of supplier". This categorization helps Sony Ericsson to choose which strategy to follow for different purchases and suppliers. In addition, Sony Ericsson does spend analyses to determine which suppliers mainly bought from in each category.

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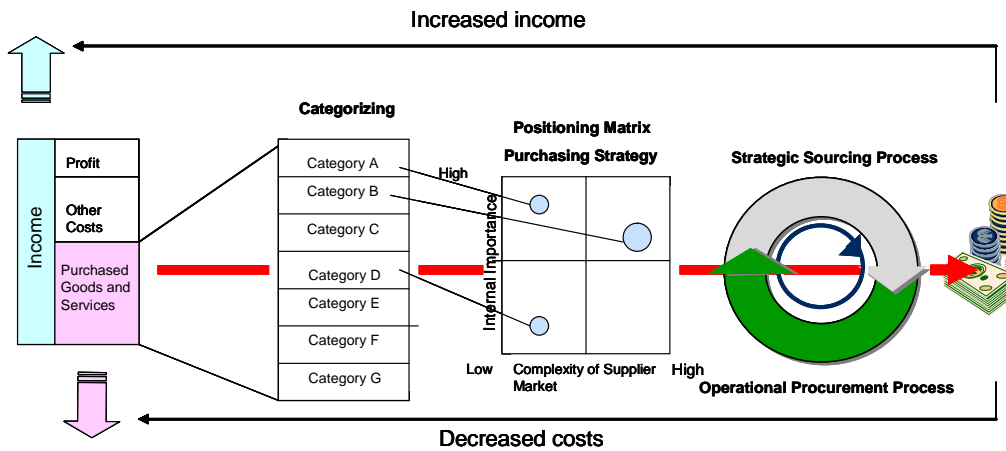


Figure 14 Model for development of supplier strategies¹⁴⁸

Depending on which strategy to follow, Sony Ericsson has divided their suppliers in three levels, organized as a pyramid, see Figure 15. The levels in the pyramid illustrate the importance of the relationship between Sony Ericsson and the supplier, and also the number of suppliers present in each level.

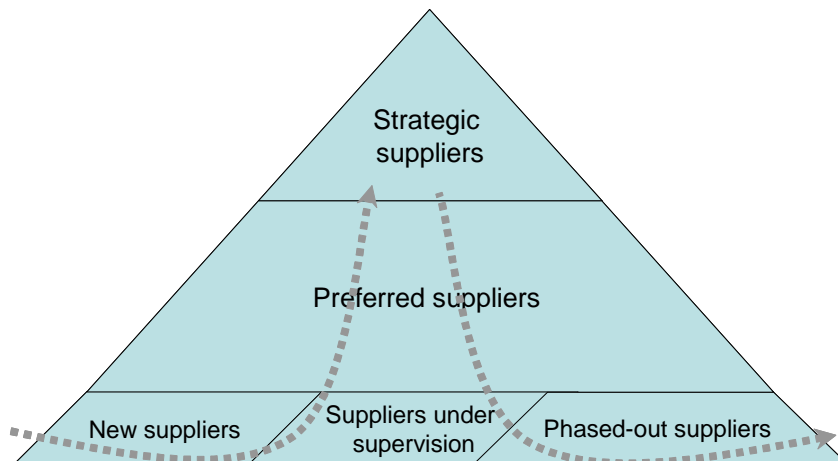


Figure 15 Supplier classification¹⁴⁹

1. *Strategic suppliers* – Suppliers that Sony Ericsson have a long-term cooperative relationship with that is designed to leverage the strategic and operational capabilities of both parties.
2. *Preferred suppliers* – Suppliers meeting Sony Ericsson's requirements regarding technology, total cost, production and supply infrastructure, and support.

¹⁴⁸ Internal material from Sony Ericsson

¹⁴⁹ Ibid

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3. *Suppliers under observation* – Suppliers with inadequate performance. Re-evaluation in 3rd quarter after entry into category. No new design-in.
4. *New suppliers* – New suppliers, new products or new services to be evaluated in 3rd quarter after entry into category.
5. *Phased-out suppliers* – Suppliers up for termination are held in this category until End Of Life (EOL) for product. No new design-in.

One problem that Sony Ericsson are facing is the large number of suppliers present in the Supplier under supervision level. The numbers of suppliers in this level is estimated to 5000 and includes many infrequent used suppliers. Hence, one internal target is to reduce the number of Suppliers under supervision. If a supplier not has the potential to be a preferred supplier it should be phased out.

4.4.1 Supplier Life Cycle

Sony Ericsson do not have an established process for the Supplier Life Cycle within IM&S. Internally they have an illustrative overview (see Figure 16), but this working process has not been implemented yet. The Supplier Life Cycle process is differently defined for the different areas within IM&S. Moreover, there is no detailed process for *phasing out* suppliers, which is seen as more complicated than contracting a new supplier. When Sony Ericsson phases out suppliers they simply stop buying from them. The problem is to mediate the message that a supplier no longer is approved to order from to people in the entire organization. The operational purchasers are in charge of continuously control such maverick buy. For example, this can be done by only allowing purchases aligned with pre-determined contractors. Also, the operational buyers can overview where purchasing outside of existing contracts are done, and try to influence buyers exceeding the rules. Still, that is a time-consuming activity since all such purchases are accumulated in one single non-approved pool.

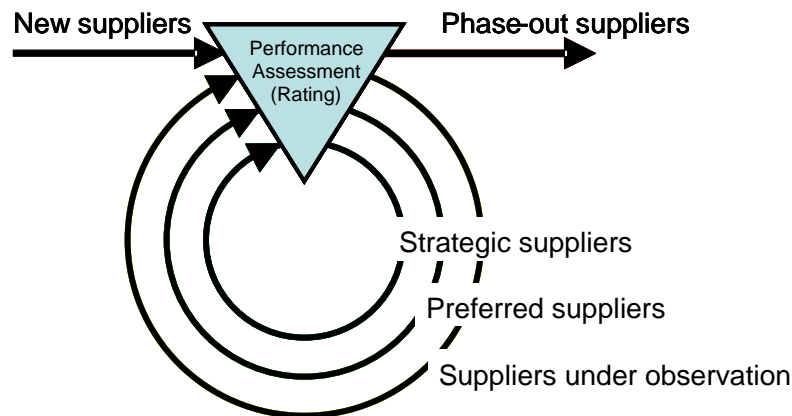


Figure 16 Supplier Life Cycle¹⁵⁰

¹⁵⁰ Internal material from Sony Ericsson

4.5 Supplier Evaluation

The purchasing strategies and working methods described above are all comprehensive for all IM&S categories. Still, the way each category manager runs his/her team differs to a great extent, particularly regarding supplier evaluation activities. Hence, to illustrate these differences an overview of three of the categories' supplier evaluation routines will be presented, namely Test and Measurement, IS/IT and Marketing.

4.5.1 Supplier Evaluation within Test & Measurement

Supplier evaluation is not an established process within T&M and has only been performed since 2005. The process was developed ad hoc and does not follow any theoretical framework. The parameters taken into consideration are:

- Outcomes – What has the supplier delivered?
- Cost leadership – Secure correct pricing.
- Financial rating – How stable is the supplier financially?
- Product quality – Number of claims, time for reparation, etc.
- Flexibility – The supplier's production capacity.

The supplier will receive grades between 1 and 5 (where 5 is best) for each parameter and then a relative importance of 10 percent each. The remaining 50 percent are measured after the order clerk's experiences of the supplier on the same scale (1 to 5). Together this gives the supplier a total grade, see Table 4.

	Requirements	Weight	Supplier rating
Enablers	technology leadership	XX %	
	project capabilities	XX %	
	maintenance capabilities	XX %	
	improvement initiatives	XX %	
Results	cost leadership	10 %	
	delivery performance	10 %	
	financial rating	10 %	
	product quality	10 %	
	flexibility	10 %	
		100 %	

Table 4 Supplier rating model¹⁵¹

More specific, when determining whether a supplier is performing superior or not, it is of great interest to estimate the TCO. As an example Sony Ericsson is prepared to

¹⁵¹ Internal material from Sony Ericsson

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pay a higher price if the supplier will take responsibility for after market related problems. It is considered being valuable to Sony Ericsson to let an external party take care of such issues, e.g. reparations. Also, in the T&M category supplier flexibility is of great importance, since the cell phone industry has many demand peaks.

Preferred suppliers are evaluated on an annual basis and usually the suppliers reach the required level. However, if the supplier fails to fulfil Sony Ericsson's requirements the supplier will be put under observation and the results from the evaluations will then be the basis for a corrective action plan. Today there is no standard process to follow for developing this type of corrective action plans.

T&M has regular meetings with the suppliers, where they inform the suppliers about what parameters they will be measured on and their performance. The supplier will also have the ability to measure themselves. So far, the supplier evaluation has given good results and has been used as an "icebreaker" with the supplier and the order clerk. The supplier evaluation is mainly used as help for developing a corrective action plan rather than questioning a specific point. One learning outcome from the first supplier evaluation round is that it is important to be able to explain the grades since the suppliers might want detailed information of its performance. Also, to succeed with the supplier evaluation, a deeper knowledge of the supplier's underlying business situation is required. The parties will benefit from having an understanding of one another's organizations and activities. For example, with an increased knowledge of suppliers, potential Preferred Suppliers can be identified more easily.

In general, focus is put on the approximately 20 percent of suppliers which stand for approximately 80 percent of total spend. The goal is to consolidate spend as much as possible in order to achieve better price offers and so on. Within T&M there are about 5-6 preferred suppliers of totally about 500 in this category. The remaining parts of the suppliers, who are not preferred, are not considered worth including.

4.5.2 Supplier Evaluation within IS/IT

The supplier evaluation within IS/IT does not follow a structured process. The evaluation is performed on a monthly basis with the largest suppliers (approximately four). IS/IT has a meeting with the supplier and they are discussing what has happened the past month, what has gone wrong and what can be done better. The parameters taken into consideration are:

- Delivery time
- Delivery security
- Delivery precision
- Price
- The supplier's behaviour

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Apart from the monthly supplier evaluations, IS/IT is not performing any evaluations. IS/IT thinks that it is important to take immediate action instead of, for example, once every year.

Suppliers that IS/IT does not usually buy from, are not evaluated at all. These suppliers are only evaluated if there is an obvious problem that occurs. The effort is put on the largest suppliers with the highest spend.

In addition, IS/IT has meetings with the internal buyers in order to investigate what they think about the suppliers and how they experience the service. By having these meetings the information is spread in the organization, from operational level up to the managers.

4.5.3 Supplier Evaluation within Marketing

Marketing is considered a relatively immature category compared to the others. Supplier evaluations are done before choosing a supplier and on existing suppliers. There is not a defined, structured process to follow and the supplier evaluation is performed differently for different areas within Marketing and depending on type of relationship with the supplier. The majority of the evaluations are performed at top spend suppliers.

A methodology used for suppliers in the area Creative is the use of various KPIs. Marketing has quarterly meetings with the creative suppliers where they have an open discussion with the suppliers regarding how they perform. Also, a more detailed review is conducted annually. Marketing defines the appropriate KPIs in the beginning of every year, which occasionally are connected to different incentives. This evaluation can also be the basis for negotiations. It is essential to have an open dialogue with the supplier to make clear which KPIs that are most important.

The use of KPIs is a methodology used for a long time. The KPIs consist to 50 percent of qualitative and 50 percent of quantitative measurements. The type of KPIs is decided by the order clerk. The basic structure is three areas of KPIs:

1. *Cost Performance* (quantitative) – the ability of the supplier to control cost, thus contribute to Sony Ericsson’s profitability.
2. *Business Performance* (quantitative) – the ability of the supplier to contribute to Sony Ericsson’s marketing effort.
3. *Qualitative Performance* – a qualitative assessment by the internal client on the ability of the supplier to perform and deliver marketing activities.

All together, the evaluation should consist of around eight to ten KPIs, where each has a minimum of 10 percent relative importance, see Table 5. The minimum requirement of supplier performance vary, this is decided when the agreement is signed. The KPIs are measured according to a scale from 1 to 4, where 1 is “very poor” and 4 being “excellent”.

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KPI Name	Rating	Weight
1. First KPI	3	20 %
2. Second KPI	3	10 %
3. Third KPI	2	15 %
4. Fourth KPI	4	15 %
5. Fifth KPI	2	10 %
6. Sixth KPI	2	15 %
7. Seventh KPI	2	15 %
Summary Final Score	2,60	

Table 5 Supplier rating model¹⁵²

If it shows that a supplier does not reach the required level, Marketing and the supplier together develop an action plan for how to improve. Sometimes it occurs that the relationship between Sony Ericsson and the supplier is not acceptable or that a specific process not is performed in a desirable way. These types of problems can be handled with action plans. On the contrary, if the quality of the creative work is not good enough there might be of current interest to change supplier.

For less strategic suppliers, there is no systematic evaluation. Only if the supplier does not follow the agreements an evaluation is performed.

¹⁵² Internal material from Sony Ericsson

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5 Tetra Pak

This chapter is based on interviews with various people working at Tetra Pak. We have chosen not to refer continuously in the text because of awareness of the interviewees' own requests.

5.1 Overview of Tetra Pak

Tetra Pak AB was established in Lund 1951, by Ruben Rausing and Erik Wallenberg. Today, Tetra Pak is one of three independent industry groups within the Tetra Laval Group, which also consist of DeLaval and Sidel. All together the group focuses on: “*systems for processing, packaging and distributing food and accessories for dairy production and animal husbandry*”¹⁵³.

Tetra Pak is operating in more than 165 markets, have over 20 000 employees and had a turnover on more than 8 107 Million Euros in 2005.¹⁵⁴

5.2 Purchasing Organization and Categorization

Tetra Pak's purchasing organization is divided into seven categories, four related to direct material and three related to indirect material, see Figure 17.

Direct material:

1. Base Material: packaging material, aluminium, paper, etc.
2. Additional Material: all equipment needed to the packaging, e.g. corks, straws, etc.
3. Packaging equipment: all components needed to repair the filling machines, e.g. spare parts.
4. Processing equipment: same type of material as in packaging equipment.

Indirect material:

1. Factory capital equipment: all investments related to the factories.
2. Transport and travel: travel, transport and logistics agreements and include all global agreements.
3. Other indirect: all other indirect purchases that do not fit into the other two categories.

¹⁵³ <http://www.tetrapak.com> (28-02-2007)

¹⁵⁴ Ibid (28-02-2007)

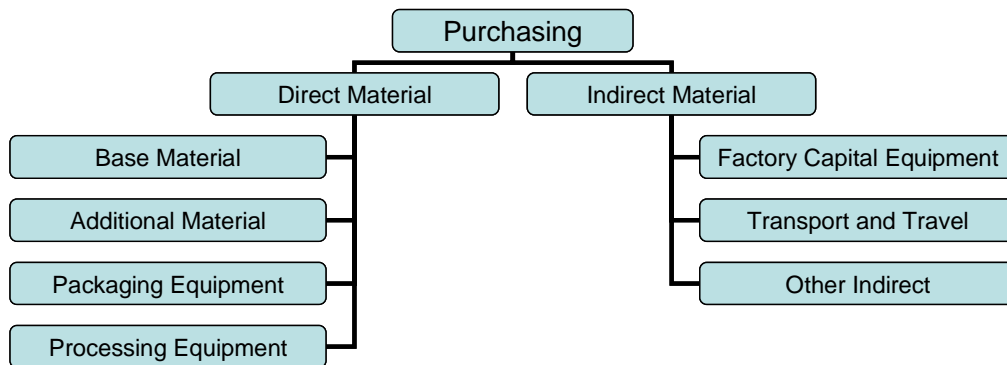


Figure 17 Purchasing organization¹⁵⁵

Due to recent consolidations of companies within Tetra Pak, it is easier to work with purchasing today than it was earlier. Before the consolidations there were about 10 to 12 purchasing organizations that were not coordinated with each other. About four years ago Tetra Pak implemented an overall process which is valid for all categories. However, Tetra Pak has focused on direct material for a long time and has not reached as far with the processes concerning indirect material. Focus has been especially on Base material and the strategy has been to create long-term relationship with the supplier within this category.

5.2.1 Other Indirect

The category “Other indirect” has developed in the recent three years. Earlier, no development was made with this large category. This category is divided into five sub categories, see Figure 18, and each category has a Category leader.

1. Facility material: purchases related to facilities, e.g. office furniture, cleaning services, dining, etc.
2. Maintenance, Repair and Operation (MRO)
3. Human Resources and Professional Services (HR/PS): e.g. recruiting, consultants, etc.
4. Marketing and Communication (MarCom): from research to creative bureaus
5. IT: e.g. computers, servers, etc.

¹⁵⁵ Constructed as said by interviewees at Tetra Pak

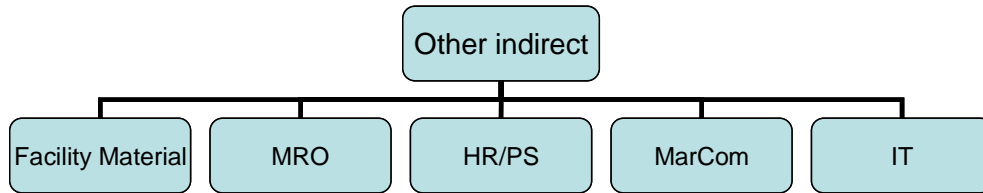


Figure 18 Other indirect organization structure¹⁵⁶

Every sub category has different commodities and following sub commodities. The structure of “Other indirect” is currently being implemented in SAP R/3.

When the structure of Other indirect was defined, Tetra Pak was benchmarking against IKEA in order to investigate how they were structured. The difference between IKEA and Tetra Pak is that Tetra Pak does not want to have a large organization for functions that is not core-business. Thus, Tetra Pak wants to have a centralized management with a close cooperation with local offices around the world.

5.3 Use of ERP System

Tetra Pak is currently implementing SAP R/3 world-wide. The use of SAP R/3 is mainly within the process of P2P (described below). The implementation of SAP R/3 makes it possible to make a purchase order, make a requisition and approve the requisition, etc. in the system and not manually as before. The system also makes the process more stringent and all approved suppliers must be registered which forces people to use same suppliers.

The implementation of SAP R/3 requires that some parts of the organization structure have to change. Also, some functions must be put into the system. A company can choose to implement SAP R/3 strictly as it is. However, Tetra Pak’s processes differ from the ones in SAP R/3 and therefore some changes must be done in order to adapt Tetra Pak’s processes. It is pointed out that there is a difference between modifications and developments. Modifications are not aloud but development and adjustments are necessary. A number of the necessarily adjustments are easy to adjust to fit SAP R/3.

It is a fact that SAP R/3 will be implemented all over the world, but the interviewees have different opinions if SRM will be implemented in order to support the sourcing processes or not. Within the Other indirect material category, an implementation of SRM is considered being mandatory, since SAP R/3 does not offer all functions required. However, another view in the company is that SRM will not be necessary until the organization of indirect material have a better structure. An IT-system will

¹⁵⁶ Constructed as said by interviewees at Tetra Pak

not solve any problems until Tetra Pak has a better overview and control of the indirect purchases.

Also, there are different opinions among the persons interviewed regarding benefits as well as negative aspects from implementing SAP R/3 and SRM. One reason not to rely only on an IT-system is the system's inability to search for the root of a supplier relationship problem. That is, SAP R/3 and SRM can not compensate the human communication between Tetra Pak and its suppliers. Also, one apprehension about SRM and the catalogue system is the update process required. It is considered as a risk, not to be able to manage the change of the supplier base which will create a mess in the system. On the other hand, one opinion heard is that SAP R/3 and SRM will enable information gathering not otherwise possible. Hence, measure of contract compliance and other measurements described above will be possible.

5.4 Supplier Strategies

The main process Supplier Management, see Figure 19, describes how Tetra Pak is working with the supplier life cycle on a long-term perspective. This process consists of three sub processes:

1. Sourcing – find new suppliers
2. Contracting – how to commit an agreement
3. P2P (purchase to payment) – describing purchasing orders, payment, etc.

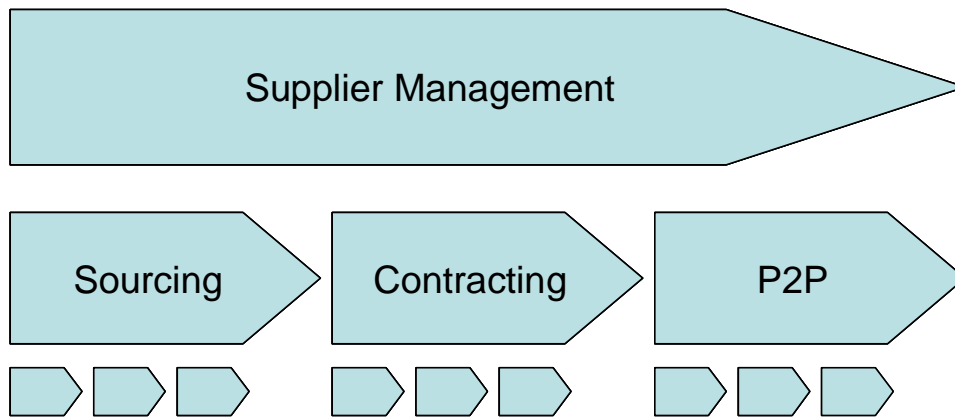


Figure 19 Supplier Management Process¹⁵⁷

The first step describes how to optimize the supplier base and consists of a Present Value analysis to analyze what to do with the supplier. The output from this step is the supplier strategy for how to act in each product category. This strategy is the basis for how to work with the suppliers, which can differ depending on type of product category. For example, Base Material depends on oil prices and therefore it is good to trade continuously and follow the stock exchange. But for example for Packaging equipment, which is considered to be more standard components, it is more advantage to use long-term relationships.

¹⁵⁷ Constructed as said by interviewees at Tetra Pak

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In the last step the overall strategy will be broken down into strategies for each supplier. This step describes the every day work with the supplier and what kind of relationship that is preferable. This step also has support processes:

- Audit/Assessment – describing how to perform a supplier audit. It is not pre-determined how often this should be done.
- Restore supplier performance – describing how to perform corrective actions if the supplier does not follow the requirements.
- Phase out – describing how to phase out a supplier in a proper way.

The process for the category “Other indirect” differs from the process above. The reason why Tetra Pak had to define a different process is because they discovered that the process did not fit this type of products. The main difference between direct material and indirect material is that a demand does not come up by itself. Therefore, a team must be established in order to catch up demands. Tetra Pak has implemented the concept Smart Buy, which consists of different components; Process/methodology, Strategy/Tools, Purchasing expertise and the team. Smart Buy is a collaboration with IBM. Another party is the business, which consists of a sponsor, a team, a specification and an implementation. Together, these parties work as a team during the sourcing process for “Other indirect”. This process describes how to define strategies for the different categories and consists of a six-step process; see Figure 20.

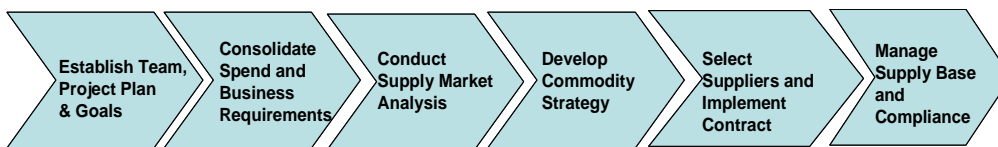


Figure 20 Sourcing process for other indirect¹⁵⁸

When this process was developed, the sub process for P2P described above was not implemented and it was not customized to the processes defined in SRM. Instead, this process is based on the financial strategy. Each step has a clear and defined work flow defining what to do and by whom. The overall process, performed as a project, takes about 20-25 weeks. The demands and input for starting a project, e.g. if Tetra Pak should have global or local contracts, come from the business. It is also important to receive input about the current specifications. For example when contracting with a recruiting company, it is important to know what kind of recruiting company that Tetra Pak is seeking and achieve detailed specifications about this. For this information, HR management describes the specification and is also acting as a sponsor. Demands from all geographic areas are taken into consideration. Later when the project is implemented it is important that the sponsor supports the project.

There are only a few suppliers that are considered to be strategic within the indirect segments. One example of a strategic supplier is the supplier of lubricating oil,

¹⁵⁸ Constructed as said by interviewees at Tetra Pak

which is very important for Tetra Pak. In order to make the right decision regarding local or central contract, the sourcing process helps to decide how to act. In some cases it is not meaningful to use global contracting, because the benefits do not overcome the effort. However, there is a difference between a strategic supplier and a supplier with a long-term relationship. For example Dell, who is delivering computers and Sony Ericsson, who is delivering mobile phones, are two suppliers that Tetra Pak has a long-term relationship with but that are not considered to be strategic.

5.5 Supplier Evaluation

There are variations of how the supplier evaluation is performed between different categories. Therefore some examples will be described in order to get an overview of differences.

5.5.1 Supplier Evaluation within Direct Material

For *direct material* the supplier evaluation is a support process as described above. The supplier evaluation differs between the different categories and is defined when the strategy is developed. Strategic suppliers are usually evaluated every second year.

There is a certified person who goes to the supplier and performs the evaluation. This person assesses the supplier after pre-determined parameters, which are defined for each category. For example Packaging equipment has three pre-determined criteria:

1. Prerequisite – concerning ethical requirements, e.g. child labour and environmental issues.
2. Performance – how the supplier is performing considering for example cost, quality and time.
3. Assessment – how well the supplier's processes are functioning.

These criteria then achieve different grades and a relative importance before a total Assessment score is calculated. The total score is currently calculated manually, but some of the performance data is collected from SAP R/3. The prerequisite and the assessment are done manually by the certified person. There is also a self assessment where the supplier assesses them selves by answering questions on a web portal. The supplier evaluation also involves the internal customers, e.g. R&D or production within Tetra Pak. These customers are involved with purchasing when the criteria for how to work together with the supplier are defined. The purchaser has the overall responsibility but will get support from the internal customer.

Depending on the total Assessment score, there are different levels to categorize the supplier:

1. Preferred supplier
2. Improve area
3. Potential phase out

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The goal is that all suppliers should be preferred suppliers and after the supplier evaluation Tetra Pak and the suppliers together define corrective actions for how to reach the preferred level. The supplier knows about the criteria in advance.

Also, Tetra Pak works with different KPIs to measure the suppliers. However, most of the KPIs related to suppliers are connected to direct material. Examples of KPIs Tetra Pak uses are:

- Delivery precision: delivery precision and service level are examples of KPIs. If Tetra Pak has demanded a certain date of delivery the supplier should confirm and then deliver on the exact date. The delivery precision will be measured on plus/minus days in variation to the promised day. A good service level can for example be if the supplier can offer flexibility and deliver on another date than promised if Tetra Pak asks for changes.
- Price development: Tetra Pak measures how the price changes and also contract compliance.

5.5.2 Supplier Evaluation within Other Indirect

The supplier evaluation process is not yet implemented for indirect material. Tetra Pak will only investigate the supplier of indirect material if they discover criticism of essential points, e.g. claims. The reason why Tetra Pak does not evaluate suppliers of indirect material is because of the large amount of suppliers. The ratio between the amount of direct material suppliers and indirect material suppliers is 1 to 100. Historically, purchases of indirect material have been done individually of every single order clerk. Therefore Tetra Pak currently focuses on structuring and decreasing the supplier base and centralizing the purchases with global contracts.

Regarding indirect material there is a lot of changes going on and therefore measures have been developed in order to map the purchases. However, currently many of the KPIs are collected manually and therefore they are using simple measures.

- Purchase agreement: describes the share of purchases from existing agreements and the share outside these agreements. How well is Tetra Pak following the agreements? Where should Tetra Pak commit new agreements?
- Contract compliance: describes how well Tetra Pak is using existing agreements.
- Vendor turnover: describes how much Tetra Pak is buying from a certain supplier and includes purchases with and without purchase orders. This also shows how much Tetra Pak is invoicing a certain supplier.

5.5.3 Supplier Evaluation within Transport and Travel

Transport and travel has an environmental evaluation of the suppliers consisting of a web based questionnaire which the supplier can answer online. This evaluation should be performed every time there is a purchasing procedure with the supplier. These questions have different points depending on importance. The concept “traffic light” is easy to understand and effective methodology. The supplier can totally get

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up to 30 points. 0-14 points are red suppliers, 16-26 yellow and 27-30 green suppliers. The questionnaire consists of about 15 to 20 questions. There should always be easy to understand what Tetra Pak think is the most important issues and what the supplier must improve to reach the green level. The questionnaires are automatically compiled and exported to excel files. If it is a new supplier Tetra Pak also approve red suppliers as long as they put up an action plan for how to improve.

However, it is difficult for Transport and travel to evaluate the suppliers on a detailed level. Tetra Pak receive statistic reports from suppliers but besides these reports they do not perform any evaluations. The reason is mainly because it is difficult capture each co-workers own apprehension about the suppliers. The only thing they evaluate is such as contract compliance.

6 SAP Supplier Relationship Management

This chapter is based on interviews with various people working at IBM Global Business Services. We have chosen not to refer continuously in the text because of awareness of the interviewees' own requests.

6.1 Supplier Evaluation

The process flow for supplier evaluation defined in SAP SRM includes four steps: define, capture, consolidate and analyze. In the first step the system requires that the user defines KPIs and evaluation method. These KPIs should be based on the overall strategy. The system support customized KPIs for specific product groups and/or suppliers. In the next step the data should be captured, which can be either quantitative and/or qualitative. The quantitative data are KPIs that can be collected automatically from the procurement transactions registered in the system. Examples of quantitative measurements are delivery time, top ten suppliers (in spend), contract compliance, etc. The qualitative data are KPIs that for example are based from the order clerk and the suppliers' subjective opinions. These KPIs can be captured through questionnaires, which are sent to the order clerk/supplier.

When the right information has been captured, it should be consolidated. The system enables the user to weight the relative importance between the KPIs in order to receive a consolidated result of the suppliers' performance. In the last step the result can be presented and analyzed by using different reports, for example visualized tables and figures, compilation reports, etc. The process described requires the user to translate the strategies to relevant KPIs. SRM is used as a tool to support the user collecting and consolidating the right information. Hence, in the last step this information should be analyzed and the user has to decide how to use the information for further action points. SRM only provides simple decision support such as alerts if the price is too high. Hence, SRM does not tell the user what to do if the result is below the company's minimum requirements.

The difference between the traditional Material Management (MM) module in SAP R/3 and SRM is mainly how to consolidate the KPIs collected. SRM enables better reports that are easier to use for the analysis. Furthermore, it is not possible to create questionnaires in MM. The interface in SRM is web based in order to make it easier to use than SAP R/3.

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7 Analysis

The theoretical framework is used as a tool when analyzing the empirical findings. Also, the studied companies are compared in order to determine similarities and differences between them.

7.1 Potential Benefits When Evaluating Suppliers

During the study we have seen that the main difference between purchasing of direct and indirect material is demand characteristic. For direct material, the demand often occurs automatically from the production. When the customer places an order, there is an automatic demand specifying the needed items for the specific product. On the contrary, indirect material requires an internal demand. Hence, the order process differs and the order for indirect material needs another kind of specification. We have seen that this difference influences the supplier evaluation, since the end customer for indirect material is an internal user. It is easier to involve an internal customer in the supplier evaluation than an external customer. The purchasing organization has better access to the internal customers and can choose to have a mandatory process for the internal customer to fulfil an evaluation.

Before developing Critical Success Factors, we found it important to understand and define the benefits of a good supplier evaluation. As mentioned in the background, companies can gain profits when managing their purchases in the right way. The overall goal for performing a supplier evaluation is to secure that the contracted suppliers reach first-class. If the company has first-class suppliers there are benefits to gain regarding several aspects. In turn, these aspects increase the companies' profits. We have identified some benefits from supplier evaluation:

- *Advantageous contracts.* If having supplier performance data as evidence, it is easier for the company to negotiate for a more favourable contract.
- *Facilitate focus on core-business.* Superior suppliers enable the company to put less effort on claims and after market activities.
- *Increased good-will.* A supplier with, for example an environmental focus, will create a good standard which the company can gain good-will from.
- *Competitive advantage.* A pro-active supplier will not be satisfied with "good enough". If the supplier comes up with improvements of the product, supply chain or supplier service the company and supplier can benefit from continuous improvements.

7.2 Current Supplier Evaluation at Sony Ericsson and Tetra Pak

When studying the existing supplier evaluation performance at Sony Ericsson and Tetra Pak, we discovered that this process is not thorough developed. At Sony Ericsson they evaluate the suppliers in various ways depended on the category. For example, the regularity of supplier evaluation diverges among categories, and the

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practices for supplier evaluation differ in structure and level of detail. At IS/IT the suppliers are evaluated every month. On the contrary, at Test and Measurement a structured and sophisticated framework for supplier evaluation on an annual basis is developed. Hence, no cooperation between categories exists and the output from the supplier evaluation does not have a minimum quality requirement. We consider this being a weakness of Sony Ericsson's supplier evaluation.

At Tetra Pak, supplier evaluation is very rare. Only a small number of suppliers are evaluated and the process for this performance is not specific. Tetra Pak lack in basic knowledge of supplier performance. Parameters measuring contract compliance such as number of items delivered, delivery date and price is generally unknown. Even, the supplier base is not defined within Other Indirect. We find it remarkable that Tetra Pak is incapable of specifying the number of suppliers contracted.

Since none of the companies perform a superior supplier evaluation, we have chosen to investigate the underlying reasons for this lack of best practice. In the following sections the companies are compared and analyzed regarding three aspects: purchasing organization, categorization of indirect purchasing and implementation of ERP system.

7.3 Purchasing Organization Structure

In the theory chapter, the centralized and the decentralized purchasing organizations are discussed. Also, a relatively contemporary organization structure, process orientation, is presented. Tetra Pak has deliberately chosen not to create a centralized structure because purchasing is not considered as core-business. In addition, Tetra Pak believes that some purchases and decisions are better managed locally. This strategy differs from the one at Sony Ericsson. Instead, Sony Ericsson has a more centralized structure, where all strategic issues are managed centrally. Though, Sony Ericsson's purchasing organization is not fully centralized. For example, the category Marketing keeps some activities decentralized in order to meet local demands. This aligns with the theory, which states that a combination of centralization and decentralization is the most powerful organization type.

Another aspect, which differs between the companies, is the relationship between the direct and indirect purchasing organization. The organization structure at Tetra Pak has a closer relationship between direct and indirect purchasing. Tetra Pak define the purchasing organization as an overall organization including direct and indirect purchases. At Sony Ericsson, there is a clearer separation between direct and indirect purchases. At Tetra Pak the development of indirect purchases has been based on the methods and processes defined for direct purchases. Tetra Pak has a project group focusing on overall purchasing processes crossing all purchasing categories. That is, top management at Tetra Pak has given the purchasing organization mandate to focus on process development. On the contrary, Sony Ericsson has developed the methods and processes for indirect purchasing separated from direct purchasing. In fact, at Sony Ericsson the indirect purchasing organization has no relation with the direct purchasing organization. Also, during the empirical studies we noticed that

there is little collaboration between the categories within indirect purchasing at Sony Ericsson. We have identified a clear difference how the different categories performs a supplier evaluation. Hence, Sony Ericsson has a more functional oriented structure than Tetra Pak. Tetra Pak has an overall process crossing direct as well as indirect purchasing.

7.4 Categorization of Indirect Purchasing

There is a clear categorization of direct and indirect purchase at Sony Ericsson and Tetra Pak. Another parallel between the companies is that they have historically focused on direct purchasing; hence indirect purchasing is not further developed. This finding is in line with the earlier research announced in the theory, where it is stated that companies not until recently have realized the potential cutting costs within indirect purchasing. According to Kapoor and Gupta, approximately one quarter of the companies total expenses are related to indirect purchases. The empirical study shows that Sony Ericsson and Tetra Pak have a larger supplier base related to indirect purchases. For example, Tetra Pak has the ratio of 1 to 100 between the number of direct and indirect purchasing suppliers. The relative spend within indirect purchases together with the total amount of suppliers indicate that companies *should* put an effort on developing their indirect purchasing.

According to the theory, it is relevant to divide indirect purchasing in relation to the different purposes. Kapoor and Gupta mention five different categories; Marketing & Advertising, Information Technology, Overhead, Human Resources and Business Specific. Sony Ericsson has reached a bit further than Tetra Pak in the categorization process. At Sony Ericsson the categorization consists of five categories, while Tetra Pak only has three main categories. Especially Tetra Pak's category called "Other indirect" has gained less focus during the years. This category is very wide and consists of many different sub categories. Even though Tetra Pak and Sony Ericsson's general categorization differs, the sub categories at Tetra Pak are similar with the structure at Sony Ericsson. It is therefore shown that Tetra Pak and Sony Ericsson use a categorization in relation to different purposes as suggested in the theory.

We have seen that Tetra Pak and Sony Ericsson have developed differently during the changes of indirect purchasing. Thus, the companies have reached maturity in different areas as shown in Figure 21. Sony Ericsson has reached a higher level of maturity regarding categorization of purchases and has also a better control of the purchases. On the contrary, Tetra Pak has a higher visualization between the categories and has a pronounced process across all functions.

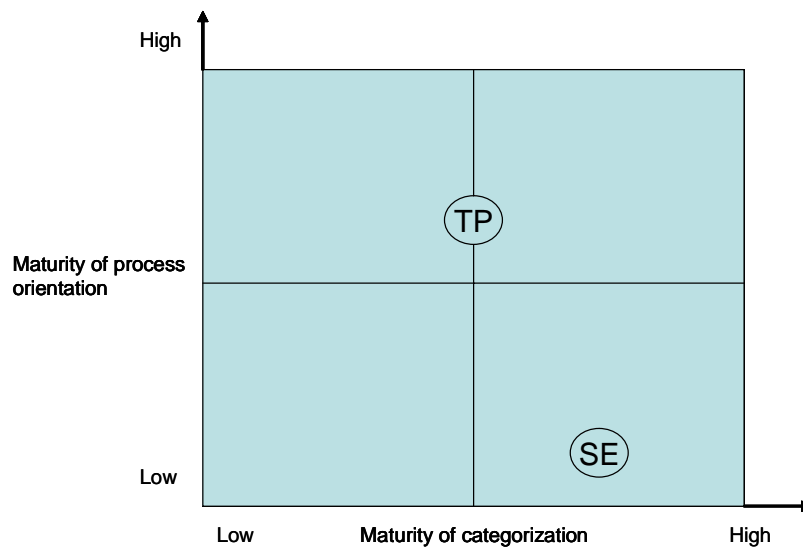


Figure 21 Development of indirect purchasing considering process orientation and categorization¹⁵⁹

The theory mentions that it is important for the company to have knowledge about what the company purchases. At Tetra Pak, we state the lack of awareness about what they purchase as problem. Hence, we hereby suggest that one way to avoid this problem is *to have a clear and defined structure of the products purchased*. Furthermore, we declare that *a process orientation enables the company to avoid sub optimization and maverick buy*, since it is a goal oriented method with focus on adding value to the company. We considerate it to be desirable to reach a high level of maturity in both process orientation and categorization, in the upper right corner, which is shown in Figure 21. Tetra Pak and Sony Ericsson have different ways to go in order to reach the upper right corner.

We recommend Tetra Pak to focus on developing the categorization. Today, Tetra Pak’s categorization is in a relatively early stage when considering the product group “Other indirect”. There is little control over the supplier base and the sub categories are defined but not yet established in the organization. The most important issue for Tetra Pak is to make an understanding within the company for the benefits of focusing on indirect material and put an extra effort on this area. The next step is to define clear strategies for how to work with suppliers for different products.

Sony Ericsson needs to focus on developing the process orientation. Sony Ericsson has a functional organization, which decreases the benefits of establishing a superior supplier evaluation. To have a process oriented structure enables the company to have homogenous goals in all areas and therefore a clear strategy for how to work with the suppliers. Furthermore a process oriented structure influence an ERP implementation in a favourable way. We will further discuss these aspects below.

¹⁵⁹ The authors own construction

7.5 Use of ERP Systems

An important issue regarding implementation of an ERP system is to use it as a strategic tool and not only as an operational tool. Hence, it is important to motivate the implementation on management level as well as at an operational level. For example, the ERP system can be used for strategic activities such as decision support. This can be an issue for indirect material, since it is a support function and not considered as core-business and as strategic as direct material. In the theory the primary focus for indirect material is e-procurement, which can be considered as operational activities. However, it is advantageous to use the ERP system as a strategic tool for indirect material as well. A large problem regarding indirect material is to get an overall view of all suppliers, which can be improved by using an ERP system since all suppliers must be registered in the system. This, in turn, increases the visibility in the organization.

Second, since the standardized processes in ERP systems are based on best practice, they generate several benefits. Also, a process orientation secures that all company employees use the same terminology, which reduces misunderstandings between divisions. However, excessively pre-determined regulations of the supplier base can lead to inconvenience in the daily work. When purchasing something infrequent a controlled supplier base will depreciate the effectiveness of the standardized process. This, in turn, decreases the benefits of using an ERP system.

Sony Ericsson and Tetra Pak focus on decreasing the number of suppliers. Using an ERP system enables a more effective way to reduce the supplier base. Today, Sony Ericsson and Tetra Pak have implemented ERP systems within the companies. Sony Ericsson has focused on the implementation and has implemented the sophisticated module SRM. On the contrary, Tetra Pak the ERP system is less utilized in the purchase work. Again, there are benefits if using the ERP system at a strategic level. SRM simplifies use at a strategic level since the module is more comprehensible. Since SRM is web based it is comparable with common used Internet sites, which makes it familiar to the user. On the contrary, the traditional ERP system is not easy to use because of complicated search paths.

In the theory, it is stated that use of an ERP system leads to a more centralized organization within a company. Furthermore, the use of an ERP system reduces the number of systems required in a purchasing organization. When we compare Sony Ericsson and Tetra Pak, we consider the organization at Sony Ericsson being more centralized than at Tetra Pak. Furthermore, Sony Ericsson has developed and implemented the ERP system in a wider context than Tetra Pak; see Figure 22. However, Tetra Pak has clearly pointed out that they do not attempt to have a fully centralized purchasing organization since sourcing is not seen as core business. From an ERP system implementation perspective, this strategy can have a negative impact on Tetra Pak regarding the gained benefit using the ERP system. An ERP system requires standardized suppliers and can not be used for small and local suppliers unless they are mapped and put into the system. Tetra Pak does not want to put an effort on these types of suppliers and therefore there is a gap between the company's

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processes and the ERP system’s processes. According to the theory, this type of gap is usually the main reason for failure when implementing an ERP system.

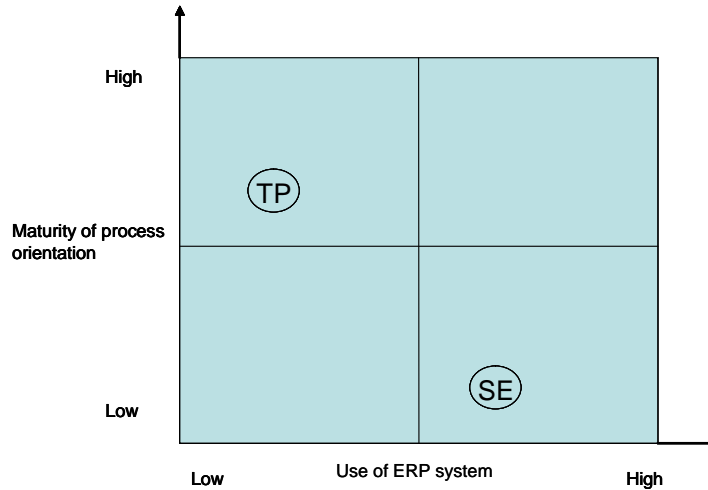


Figure 22 Development of indirect purchasing considering process orientation and use of ERP system¹⁶⁰

One relevant question we have asked ourselves is whether it is better to have clearly defined business processes or not, when initiating an ERP system implementation. As already mentioned, the companies studied have different approaches regarding process orientation. Sony Ericsson has a functional oriented organization and Tetra Pak focuses on defining overall business processes. To have a process focus in the company is considered as the strength since the process mindset will be established in the organization. However, if having processes excessively rooted in, difficulties might occur when adjusting the company’s processes in line with the ERP system’s processes. Hence, is it better not to have company processes pre-defined in order to implement the ERP system? To answer this question we have considered some positive and negative aspects with being process orientated before implementing an ERP system, see Table 6.

Positive aspects	Negative aspects
<ul style="list-style-type: none"> • The process mindset already exists • A homogenous vision of the business • Clearly defined working methods • Implementation less extensive 	<ul style="list-style-type: none"> • Trapped in old processes • Hard to change peoples’ mindsets

Table 6 Positive and negative aspects of process orientation before ERP implementation¹⁶¹

¹⁶⁰ The authors own construction

We consider it to be of advantage to have a process orientated structure when implementing an ERP system. If the company does not have a process oriented structure, there is an apparent risk that the co-workers do not understand the purpose of new working tasks. For example, a task that is not value adding for the specific person but in the end is necessary for the overall process. Also, missing cooperation between different functions can inhibit the implementation of ERP systems, which can be a risk for Sony Ericsson.

There are differences for how Tetra Pak and Sony Ericsson should act considering the use of ERP systems. We recommend Tetra Pak, which have a high maturity of business processes, to focus on the implementation and use of ERP system. Since Tetra Pak has come a long way with their processes they have a good starting position for the implementation process of the ERP system as mentioned in **Fel! Hittar inte referenskälla.** On the contrary, Sony Ericsson needs to focus on the process orientation. There is a risk that Sony Ericsson might not gain the same benefits from the ERP system if not putting an effort on the process orientation. Today, Sony Ericsson does not use the ERP system completely since it is mainly used at an operational level.

According to the Aberdeen group's benchmarking, Tetra Pak can be defined as Laggard, regarding e-procurement performance. Hence, it is important to achieve an understanding for the impact of e-procurement on management level. In addition, it is important for the rest of the organization to understand the usability. Sony Ericsson can be classified as an Industry Norm company. Therefore they should focus on increasing the use of their existing ERP system. For example functionalities for various purchasing processes, such as the supplier evaluation process can be utilized.

7.6 Definition of Critical Success Factors

The purpose of this master thesis is to determine the requirements to perform an effective supplier evaluation of indirect purchasing. These requirements could also be mentioned as Critical Success Factors. One initial hypothesis was that CSFs equals making a definition of relevant KPIs. However, in an early stage of the empirical studies we realized that KPIs could not be seen as CSFs. Also, KPIs are evolving over time, which make it less relevant to define specific KPIs. Instead, a KPI can be seen as a *tool*, measuring purchase performance. Hence, it is important to understand what the KPIs are based on. The underlying aspects to superior performance must be determined. We have identified and defined three underlying aspects, CSFs, which a company should focus on in order to perform a superior supplier evaluation:

1. The company needs to know what it purchases.
2. The company should have a controlled supplier base.
3. The company should have a homogenous vision of the purchasing goals within the company.

¹⁶¹ The authors own construction

To achieve these requirements, we have identified following areas as important for companies to focus on: *categorization of indirect purchases, process orientation and ERP systems*. First, having a clear categorization of indirect purchases indicates that the company has realized the importance of this area. A clear categorization should be based on the purpose of the purchase. If a company has a relevant categorization, it can decide the strategic importance of the purchase and what kind of supplier relationship that is appropriate. This, in turn, makes it easier to make a relevant evaluation of the supplier.

Second, if the company has a mature process orientated purchase organization, sub optimization and maverick buy can be avoided by a homogenous vision within the company. Also, with a homogenous vision, all co-workers get to know the minimum standard required for suppliers to the company. Furthermore, a process orientated structure enables a clear understanding of the positive effects if performing a superior supplier evaluation.

Third, the company can gain large benefits if implementing an ERP system. An ERP system improves the possibility of controlling the supplier base and the efficiency of performing a supplier evaluation in a structural way.

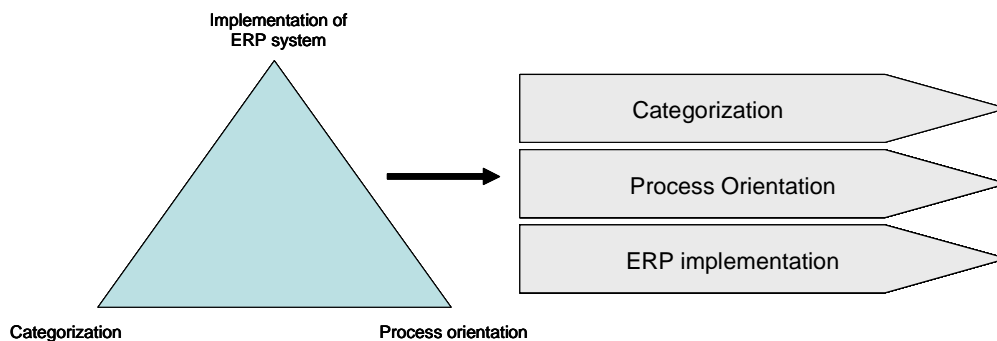


Figure 23 Long-term strategies for how to fulfil the CSFs¹⁶²

Focusing on the areas suggested above, the company will benefit from the positive improvements mentioned. However, if the company focuses on all aspects simultaneous, the success factors will combine forces. That is, positive synergy effects will occur if the factors interplay. For example, process orientation is closely connected with ERP systems. If the company is process oriented, the company's working method and the processes of the ERP system will collaborate. Also, if having a suitable categorization of purchases, the overall processes will be more powerful since the company have control over the supplier base and can work towards the same goal. Furthermore, an ERP system supports the management of purchasing categories. If the company has a detailed categorization of indirect purchases, the ERP system will simplify the work controlling the pre-determined

¹⁶² The authors own construction

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supplier base. As shown in Figure 23, the aspects are depended of one another and should therefore be executed parallel.

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8 Supplier Evaluation Model

In the previous section the basic conditions for supplier evaluation were defined. In this section a Supplier Evaluation Model is developed. Also, a description of how to use the model as a framework when performing a supplier evaluation is presented. The model is based on the findings during the work of this master thesis.

The vertical axis in Kraljic's portfolio model describes the importance of the purchase. Since many different aspects might influence the decision, we think that the importance of a purchase is complex to define. For example, "impact of profitability" is an aspect where various definitions are possible. The broad definition enables companies in various industries to use the model, which is considered as valuable. However, this aspect can also be a weakness since lack of unity can appear within one company.

At the department of Test and Measurement at Sony Ericsson the definition of important purchases equals total spend. The question is if this is the best indicator of an important purchase. Comparing with purchasing at the Marketing department, total spend has another significance. Considering marketing the costs is not that important as "value added profile", which is another aspect mentioned by Kraljic. The context of important purchase enables individuals to adjust their specific area of responsibility to be considered as important. By choosing a suitable aspect, all categories can be placed on the upper part of the vertical axis. Hence, the matrix does not fulfil the purpose of use if requirements are not properly defined. On the contrary, the portfolio presented by Olsen and Ellram suggests detailed criteria in order to classify the importance of the purchase. In Olsen and Ellram's model Competence factors, Economic factors and Image factors should be included when defining the strategic importance of the purchase. However, having excessively detailed criteria the effort categorizing all purchases will be demanding. Instead, the company is suggested to carefully determine which criteria to use as a framework classifying the importance of the purchase. We think that it is important to choose the most relevant criteria in order to further manage different purchases in the right way. There is no general definition of these criteria, but it is important for each company to *clearly define their own criteria of important purchase.*

The horizontal axis describes the relative situation between the buyer and the supplier. In order to decide the supply risk the company must investigate the market situation from a macro point of view. Like the vertical axis, we think the context of the supply risk axis is widespread and complex. Therefore, the purpose of using the matrix is not fulfilled. It is important to *analyze the industrial competition carefully and classify the purchases in the right way.*

None of the portfolio models described in the theory categorizes direct or indirect material. As a first assumption regarding Kraljic's matrix indirect material can be

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thought of as standard items, but when reconsidering, indirect material can fit in all of the four quadrants. For example, a company buying a consultant service regarding an implementation of a new infrastructure system can have a great impact for the value added and can also be seen as a critical supplier because of specific competence. Consequently, a purchase of a consultant service can be classified as a strategic item. If a company instead buys new computers to the office, it can be classified as standard items. Hence, all categories of indirect material do not have to have the same strategic goals.

The four quadrants in Kraljic's matrix have different action plans, related to which level of relationship that is of advantage. Partnership is appropriate for strategic items, short-term relationships for leverage products, secure supply for bottle-neck products and system purchasing for noncritical items. We have discovered that there is a remarkable difference between the action plans defined in Kraljic's portfolio model and the strategies found in the empirical studies. The companies studied have long-term relationships with suppliers of leverage and non-critical products as well. One example, at Tetra Pak and Sony Ericsson, is purchases of computers. The companies have global relationships with their computer suppliers, which can be considered as an important purchase. However, the supply risk is low and computers can therefore be categorized as a leverage product. The primary reason to have long-term relationships with that type of suppliers is the negotiation power when committing centrally and in a long-term perspective. Hence, a strategic importance does not equal long-term relationships. This aspect is not mentioned in Kraljic's portfolio model, which we think is a weakness.

We think that it is important to define the *strategic* importance of the purchases when choosing the right KPIs to a supplier evaluation. This can be seen as the result of Kraljic's classification of products, namely strategic items, bottleneck items, leverage items or noncritical items. The level of strategic importance is high for strategic items, medium for leverage items and bottleneck items and low for noncritical items, see Figure 24.

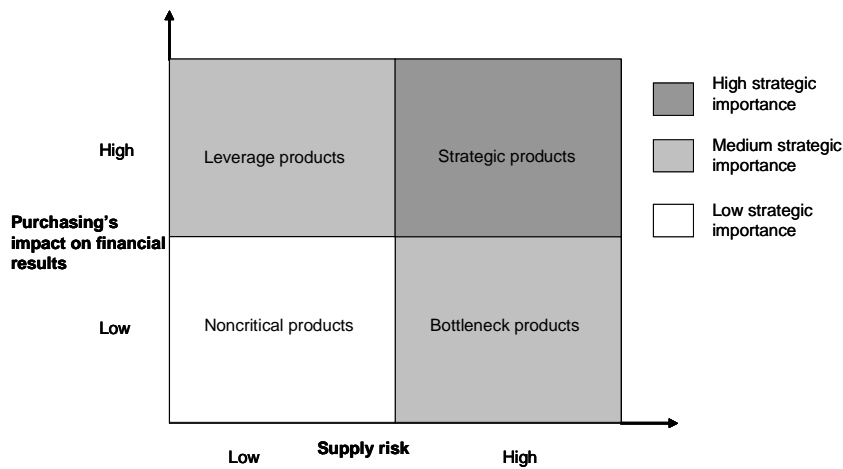


Figure 24 Strategic importance of product¹⁶³

Another aspect to consider when choosing KPIs is the relationship between the buyer and supplier. As already stated, long-term relationships are not exclusively conducted with suppliers of high strategic products. Hence, the strategic importance of products as well as the term of relationship will affect the evaluation method required. First, we think that it is important to prioritize which of the companies' suppliers to evaluate. For example, it is more important to evaluate long-term suppliers than suppliers of infrequent purchases. Second, term of relationship and strategic importance of product are two aspects which effect the supplier evaluation. Hence, we think that different evaluation methods should be used due to these aspects.

In order to define a long-term respectively a short-term relationship there are various aspects to take into consideration. The length in time is not relevant if the company only buy once every fourth year. This type of supplier can not be comparable with a supplier the company buy from on a daily basis. Hence, the definition of a long-term supplier relationship should include continuous purchases from the supplier. Also, these suppliers should be contracted for more than one year.

8.1 Actions in the Supplier Evaluation Model

The Supplier Evaluation Model in Figure 25 states the relation between the strategic importance of the product and the supplier relationship. Depending on the position in the matrix, we have defined different evaluation strategies:

¹⁶³ Kraljic's Portfolio Model revised

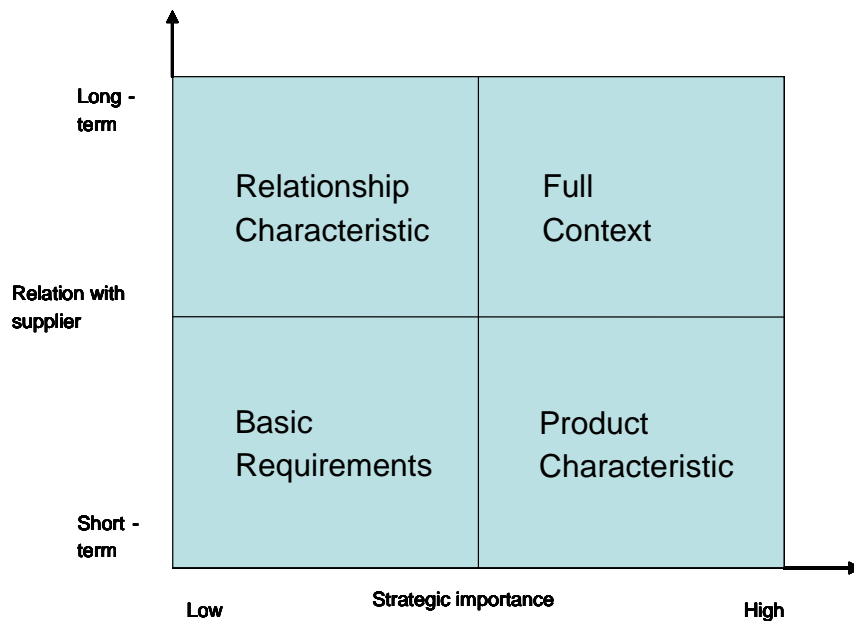


Figure 25 Supplier Evaluation Model¹⁶⁴

Relationship Characteristic

The buyer and supplier have a long-term relationship, but the product purchased is of medium or low strategic importance for the company. Supplier evaluations are relatively important, however, the focus area of the evaluation should be on the *relationship* between buyer and supplier. The model presented by Chu and Fang describe factors that are interesting to evaluate regarding supplier relationship. Hence, this model is considered to be an appropriate framework for this quadrant. Measuring the relationship requires qualitative and quantitative KPIs. The KPIs are preferably collected from questionnaires and reports from SRM. Qualitative data collected from a questionnaire can regard the supplier’s capability taking initiatives developing the co-operation and how flexible the supplier is due to changes and can be sent to the internal buyer as well as to the supplier. Quantitative data from SRM reports is for example delivery reliability and contract compliance. An example of a relationship characteristic-product identified at Tetra Pak and Sony Ericsson is computers.

Full Context

This quadrant describes strategic items characterized of long-term relationships with the suppliers. Therefore supplier evaluations are of great significance. The evaluation should include qualitative and quantitative KPIs considering the supplier relationship and the product characteristic. Huang and Keskar’s model include several aspects regarding product, supplier and society and is therefore suitable for this quadrant. Likewise relationship characteristic-products, in SRM questionnaires as well as reports should be utilized when performing the evaluation. However, more aspects are to be considered. Questionnaires can include product characteristic as well as supplier characteristic KPIs such as specification compliance, supplier co-operation, etc.

¹⁶⁴ The authors own construction

Reports, such as delivery reliability, number of claims, etc. can be captured from SRM. The evaluation should be performed on a regular basis depended on the specific product cycle. An example of a strategic important product with a long-term relationship is PR events at Sony Ericsson.

Product Characteristic

In this quadrant, products that are of strategic importance but are not purchased so often is described. Hence, supplier evaluations should focus on the actual product and not the supplier relationship. This evaluation should be very easy and not complicated to perform, since the effort should not exceed the purpose. In this quadrant the internal buyer's opinion are of greater interest than the supplier's opinion since the product is important. An example of product is a software application for Tetra Pak's R&D division, which is critical for development but is a one-time purchase.

Basic Requirements

This is noncritical products that are purchased infrequently. It is not value adding to perform a supplier evaluation on these products. A typical example is Friday snacks to a local office. However, it is still important to secure that the basic requirements are fulfilled by the supplier.

8.1.1 Type of Evaluation

We think that the regularity of the supplier evaluation should depend on the specific character of the product and which quadrant it is categorized in. For example, a short purchasing life cycle requires a more frequent supplier evaluation.

The KPI models described in the theory are mainly focusing on the relationship between the supplier and buyer. Especially Huang and Keskar's model together with Chu and Fang have defined KPIs from the supplier point of view. In the empirical findings, we have discerned that it is important to focus on the product aspects as well. For example, the supplier evaluation relevant for product characteristic-products should include KPIs related to the product instead of supplier relationships. Therefore, we suggest using Huang and Keskar's model focusing on the product related and society related clusters.

In the analysis, one main difference between direct and indirect purchases was mentioned. Purchases of indirect material allow a *direct communication* with the end customer of the item purchased. This possibility can be utilized in the evaluation work. We think that it is valuable to have access to the end customer's opinions; hence the evaluation work is even more powerful, since the supplier and the buyer have a better understanding of one another's needs. This is an important aspect to take into consideration when conducting the supplier evaluation.

8.2 How to Use the Supplier Evaluation Model

A successful use of the model requires a three-step action process. First, the company needs to define the strategic importance of the purchase. This can be done by using

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Kraljic's purchasing portfolio model. Second, the appropriate type of supplier relationship should be decided. These two steps constitute the basis for the utilization of the supplier evaluation model developed above. Depending on which quadrant the purchase is categorized into, we have defined four types of evaluation methods. This three-step action process should be performed on a short-term horizon and can be seen as a cyclical process, see Figure 26.

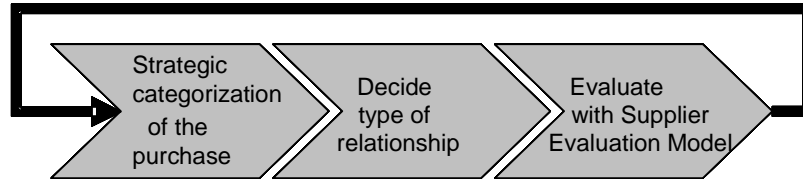


Figure 26 Action process for supplier evaluation¹⁶⁵

¹⁶⁵ The authors own construction

9 Conclusions

The conclusion compiles our findings and fulfils the purpose defined in the introduction: determine the requirements to perform an effective supplier evaluation of indirect purchasing and critically examine in what ways companies can use an ERP system as a tool to improve the efficiency of the evaluation process. Furthermore, develop a supplier evaluation model, which can be used as a framework when evaluating suppliers.

Purchasing of indirect material can be of strategic importance. Therefore companies should focus on indirect purchasing. In order to increase the efficiency and effectiveness regarding supplier evaluation there are actions to take at a long-term as well as a short-term perspective see Figure 27.

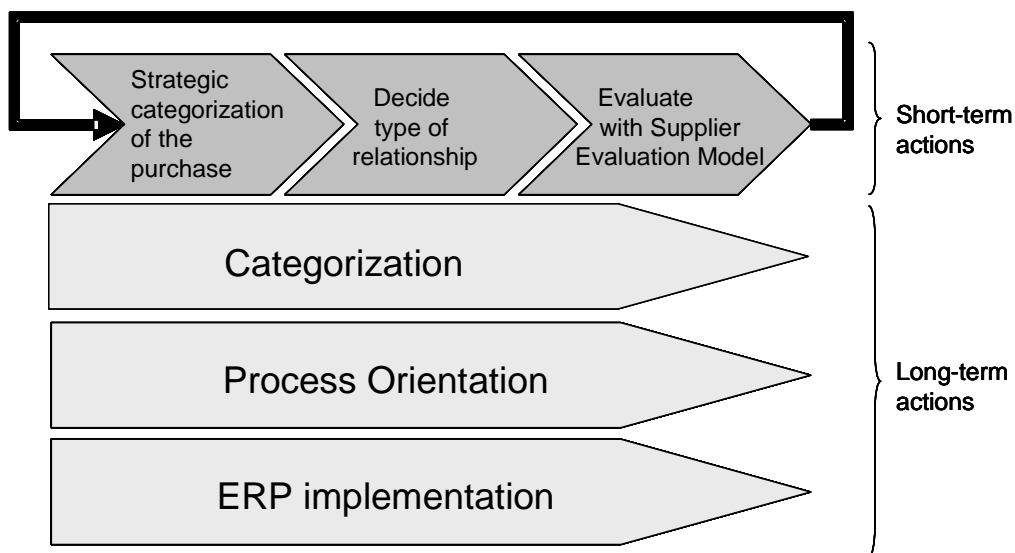


Figure 27 Action plans to increase the efficiency and effectiveness¹⁶⁶

As a *long-term action plan*, which increases the efficiency, companies should focus on the following CSFs identified:

- Have knowledge about what they purchase.
- Have a controlled supplier base.
- Have a homogeneous view of purchasing processes.

This requires that companies categorize their purchases, become process oriented and implement an ERP system. An ERP system increases the effectiveness of a supplier evaluation. However, the best benefits are gained if *combined* with a

¹⁶⁶ The authors own construction

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relevant categorization of the purchases and a clear process oriented purchasing organization. Hence, companies should focus on these three areas parallel.

In previous studies it is shown that the supplier evaluation should be based on the strategic importance of the purchase. Also, it was suggested to have long-term relationships with suppliers of strategic purchases only. However, during the empirical study one remarkable finding was in conflict with the theory. Companies tend to have long-term relationships with suppliers of non-strategic purchases as well. Hence, the empirical study supports long-term relationship with different types of suppliers.

As a *short-term action plan*, which increases the effectiveness, companies should:

1. Categorize their purchases according to Kraljic's purchasing portfolio matrix in order to define the strategic importance.
2. Decide whether to have long-term or short-term relationship with the supplier.
3. Evaluate the supplier according to the *supplier evaluation model*, which defines four different scenarios depending on point 1 and 2.

The *supplier evaluation mode* (Figure 28) takes the supplier relationship as well as the strategic importance of the product purchased into consideration and describes how to perform a supplier evaluation for different kinds of purchases and supplier relationships. Strategic products bought infrequently, should be evaluated with focus on the *product*. On the contrary, non strategic products with long-term relationship should be evaluated with focus on the *supplier relationship*. The evaluation should be based on a mix between the product and the relationship for products with strategic importance and long-term relationship.

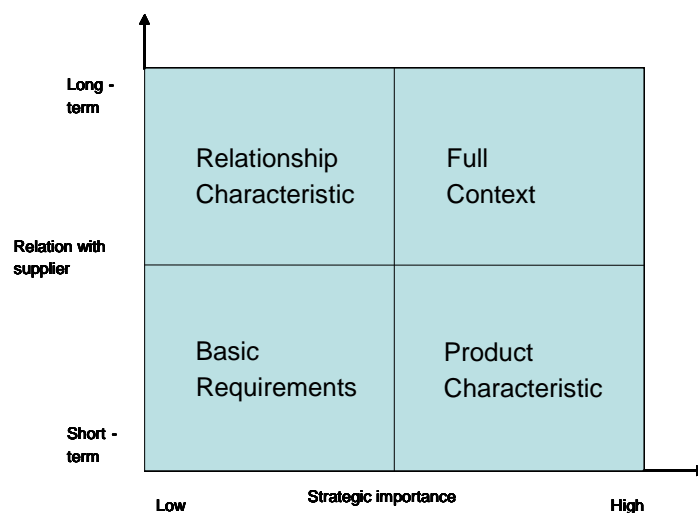


Figure 28 Supplier Evaluation Model¹⁶⁷

¹⁶⁷ The authors own construction

9.1 Further Research

In this study it is stated that companies tend to have long-term relationships with non-strategic as well as strategic suppliers. In the supplier evaluation model developed, companies are recommended to base their supplier evaluation on strategic importance of purchase and characteristics of the relationship. The first aspect, strategic importance of purchase, is a common research area. A large number of studies have been executed within this area. The companies studied in this thesis are familiar with relevant portfolio framework to use when determine the strategic importance of the purchase. However, little effort has been on investigating the underlying reasons for long-term supplier relationships. Until now the academic world equalized long-term supplier relationships with strategic important purchases. However, the opposite is now shown. Therefore, the underlying reason for long-term supplier relationships is considered as an interesting area for further research. Furthermore, it would be of interest to compare differences of supplier relationships between indirect and direct purchasing to decide if long-term relationships with non-strategic suppliers are dedicated for indirect purchasing only.

Another area of further research is to confirm the conclusion that categorization of indirect purchases, process orientation and ERP implementation interplay. In this study the empirical findings consist of two companies, which are weak in different areas. It would be interesting to examine in what way a company, performing superior within all three areas suggested, perform.

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Appendix

Interview questionnaire

Övergripande

1. Kan du förklara er inköpsorganisation? Var sitter du i organisationen, vad jobbar du med?

Leverantörstrategier

2. Hur strukturerar ni upp produkter ni köper in och sättet ni arbetar med inköp? Vad har ni för indelning av era inköp?
3. Hur ser ni på relationen med leverantören med avseende på indelningen?
4. Har ni många eller få leverantörer? (Frågan utgår ifrån uppdelningen som företaget anger på fråga 3)
5. Hur ser leverantörslivscykeln ut? (klassificering, går ni igenom leverantörsbasen för att fasa ut gamla leverantörer, vilka är aktiva ej aktiva)
6. Hur jobbar ni med investeringar rörande inköp? Dvs hur tätt binder ni er till en leverantör och gör investeringar relaterade till denna leverantörsrelation?
7. Följer ni någon specifik teoretiskt modell?
8. Hur ofta utför ni leverantörsutvärdering?
9. Vad har ni för Toll Gates för att gå vidare till nästa steg i en process? (Mål/hur mäta?)
10. Vilka kriterier har ni för leverantörsutvärdering och hur jobbar ni med dem?
11. Vad har kriterierna för relativ betydelse?
12. Vad händer om inte kriterierna uppfylls?
13. Hur säkerställer ni att ni fokuserar på rätt kriterier?
14. Vad anser ni är styrkorna/svagheter med er leverantörsutvärdering?
15. Hur skulle du säga att best practice för leverantörsutvärdering ser ut? Benchmarkar ni leverantörsutvärdering internt mellan egna bolag? Vad mäter ni då?
16. Jämför ni er med andra företag?

Tekniker för utvärdering

17. Hur utför ni leverantörsutvärdering rent praktiskt?
18. Utvärderas alla leveratörer på samma sätt?
19. Har ni en specifik modell ni följer?

Affärssystem

20. I vilken utsträckning och på vilket sätt använder ni ert affärssystem till att utföra leverantörsutvärdering idag?
21. Har ni märkt någon skillnad i effektivitet/ineffektivitet i jämförelse med tidigare, när ni inte använde affärssystem?

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22. Vad är styrkorna/svagheterna med affärssystemet? Får ni ut den informationen ni önskar ur affärssystemet? Finns det någon information som ni saknar? Vad fungerar bra med informationen ni får ut?
23. Hur pass integrerade är ert system mot leverantörernas system?
24. Har ni anpassat systemet efter egna behov (inom leverantörsutvärdering)?
25. Vem använder systemet (både vad gäller inköp och utvärdering)?
26. Hur anpassar ni utvärderingen efter ändrade förutsättningar? Har ni ändrat er leverantörsutvärdering de senaste två åren? På vilket sätt? Varför?
27. Följer Tetra Paks processer SAP?
28. Vad har du för tankar om SRM?

Avslutande frågor

29. Skulle vi kunna ta del av några exempel av era utvärderingsrapporter?
30. Finns det ytterligare personer eller information som tycker att vi skulle kunna ta del av för att förstå ditt företags arbetssätt bättre?

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