Future perspectives for the procurement function

Procurement 2025

MASTER'S THESIS

Andreas Kaltenbrunner
Registration Number 0951634
Benedikt Schraik
Registration Number 0828264

Advisor: Assistant Prof. Mag.rer.soc.oec. Michael Filzmoser, PhD

Technische Universität Wien
A-1040 Wien ▪ Karlsplatz 13 ▪ Tel. +43-1-58801-0 ▪ www.tuwien.ac.at

Erklärung zur Verfassung der Arbeit

Andreas Kaltenbrunner
Puchkirchen 51
4849 Puchkirchen

Benedikt Schraik
Engerthstrasse 156A/14
1020 Wien

Hiermit erkläre ich, dass ich diese Arbeit selbständig verfasst habe, dass ich die verwendeten Quellen und Hilfsmittel vollständig angegeben habe und dass ich die Stellen der Arbeit - einschließlich Tabellen, Karten und Abbildungen -, die anderen Werken oder dem Internet im Wortlaut oder dem Sinn nach entnommen sind, auf jeden Fall unter Angabe der Quelle als Entlehnung kenntlich gemacht habe.

Wien, 08.2014 — Benedikt Schraik

Wien, 08.2014 — Andreas Kaltenbrunner

Distribution of the work

Generally, this thesis has been created by means of a joint effort by both authors, Benedikt Schraik and Andreas Kaltenbrunner. Some parts have been created independently by one of the authors while some parts have been created together as shown in table 1.

Tabelle 1: Distribution of the work between the authors

Part	*Author*
Introduction	Kaltenbrunner / Schraik
State of the art: Purchasing tasks	Kaltenbrunner
State of the art: Organisational design	Schraik
State of the art: Purchasing professionals	Schraik
State of the art: Environmental influences	Kaltenbrunner
Method: Interviews	Kaltenbrunner
Method: Qualitative content analysis	Kaltenbrunner
Method: Survey	Schraik
Results: Introduction	Kaltenbrunner
Results: Sample description	Schraik
Results: Results	Schraik
Results: Relations between different data	Schraik
Conclusion and discussion:	Kaltenbrunner / Schraik
Abstract	Kaltenbrunner / Schraik

Acknowledgements

The creation of this thesis took approximately one year and would not have been possible without the support of a number of people:

Dkfm. Heinz Pechek, CEO of the ”Bundesverband für Materialwirtschaft Einkauf und Logistik in Österreich”(BMÖ) initiated this project as he realized there is a lack of research in the field of purchasing. Mr. Pechek supported us with his considerable knowledge and the network of the BMÖ that allowed us to interview chief purchasing officers of several of Austria’s most reputable corporations. Furthermore, the BMÖ supported the survey by inviting its members to participate in the survey.

Our academic advisor Dr. Michael Filzmoser supported us during the creation of this thesis, suggested interesting methods and helped us get back on track whenever we faced a situation that was difficult to manage. Furthermore, Prof. Dr. Sabine Köszegi supported us, helped us choose the right methods and suggested ways to efficiently leverage the network of the BMÖ.

Moreover, Ms. Anita Siemayr, BSc. helped us conducting the transcriptions and the coding for the qualitative content analysis.

Finally, we would like to thank our families and friends who gave us their full support during the creation of this thesis and the entire study program.

Abstract

The purchasing function has emerged as a central and important function in today's enterprises. It is the interface between suppliers and internal competences. Therefore, the purchasing function is an important driver for creating competitive advantages.

This thesis aims at evaluating the future development of the purchasing function with a time scope of 10 years. It analyzes the consequences of these changes for purchasing personnel and evaluates the drivers behind these changes. In the first step, interviews with chief purchasing officers of Austrian industrial companies and other professionals closely interacting with the purchasing function have been conducted. The knowledge gained through the systematic evaluation of these interviews has been used for conducting a representative survey among Austrian professionals, mainly executives in the field of supply management. Subsequently, the survey has been evaluated statistically and the results have been interpreted with regards to their relevance for answering the research question.

The results show that the purchasing function is in general gaining importance and the requirements for the purchasing function are increasing. While the importance of operational tasks seems to be stagnating, strategic tasks gain importance. This causes the requirements for purchasing professionals to rise. These changes are also visible in the education requirements: While an academic education is increasingly expected, educational institutions in Austria are not yet capable of providing the necessary specialised purchasing education.
The rising requirements for the purchasing function can be expected to cause organizational adaptations as well: The role of the chief purchasing officer can be expected to be positioned not more than one level below the executive board. However, the level of centralization or decentralization is not expected to change. With regards to measuring the success of the purchasing function, it can be expected that the importance of monetary indicators will heavily exceed the importance of non-monetary indicators in the future.
Soft skills are important for purchasing personnel and will stay very relevant in future, however, solid knowledge of English language, legal know-how, technology know-how and project management skills can be expected to grow fastest. The ability to cope with pressure and high work load seems to be the most important skill for purchasing personnel.
Therefore, the purchasing function will gain overall importance in the future.

Kurzfassung

Der Einkauf ist zu einem zentralen Bereich vieler Unternehmen geworden. Er ist die Schnittstelle zwischen Lieferanten und firmeninternen Kompetenzen, dadurch stellt er einen wesentlichen Treiber für einen Wettbewerbsvorteil dar.

In der vorliegenden Arbeit wird untersucht, wie sich der Einkauf in den nächsten 10 Jahren entwickeln wird, welche Auswirkungen diese Veränderungen auf die Mitarbeiter dieses Funktionsbereiches haben werden und welche Treiber hinter dieser Entwicklung stehen. In einem ersten Schritt wurden Interviews mit Einkaufsleitern österreichischer Industrieunternehmen und mit Führungskräften anderer Funktionsbereiche, die eng mit dem Einkauf zusammenarbeiten, durchgeführt. Die Erkenntnisse, die sich aus der systematischen Auswertung dieser Interviews ergaben, wurden für die Erstellung einer repräsentativen Umfrage unter österreichischen Fachkräften, wiederum vorwiegend mit Mitarbeitern aus dem Einkauf, genutzt. Diese Umfrage wurde anschließend statistisch ausgewertet und die Ergebnisse wurden hinsichtlich ihrer Relevanz für die Beantwortung der Forschungsfrage interpretiert.

Es zeigt sich, dass der Einkauf insgesamt an Bedeutung gewinnt und die Anforderungen an seine Mitarbeiter im Steigen begriffen sind. Während im Allgemeinen eine Stagnation der Bedeutung operativer Tätigkeiten feststellbar ist, werden strategische Aufgaben zunehmend wichtiger.
Diese Veränderungen manifestieren sich auch in den Bildungsanforderungen: Hier ist eine zunehmende Akademisierung zu erwarten, wobei festgestellt werden muss, dass die österreichischen Bildungsinstitutionen den Bedarf an spezifischer Einkaufsausbildung noch nicht zufriedenstellend abdecken.
Die gestiegenen Anforderungen werden sich auch in einer organisatorischen Aufwertung des Einkaufs bemerkbar machen, es ist jedoch weder mit einer starken Zentralisierung noch mit einer Dezentralisierung zu rechnen. Der Erfolg des Einkaufs wird in Zukunft weiterhin vorwiegend durch monetäre Kennzahlen bestimmt werden, qualitative Kennzahlen gewinnen kaum an Bedeutung.
Softskills sind zwar wichtig und werden ihren Stellenwert auch behalten, neben überdurchschnittlicher Belastungsfähigkeit werden in Zukunft aber besonders solide Englischkenntnisse, juristische Kenntnisse, Technologiewissen und Projektmanagementfähigkeiten an Relevanz gewinnen.
Insgesamt wird der Einkauf also in Zukunft an Bedeutung gewinnen und seine zentrale Rolle in Unternehmen ausbauen.

Contents

CHAPTER 1

Introduction

The procurement function is one of the most important functions in private and public companies. It is one of the main components of the value creation process [85] and closely interacts with other functions like production, sales and product development. The efficiency and effectiveness of the procurement function of a company influence costs and quality of resources like raw materials, standard parts and machinery throughout the whole company.
As reductions in purchasing prices are highly relevant with regards to profitability the purchasing function has an important role within the corporate structure. It is highly relevant with regards to short term profits as well as a companies long-term financial success. This reasons contribute to the purchasing function being of high strategic importance.[100]

The nature of the procurement function is changing at the moment as internal and external factors change (globalisation, outsourcing, information and communication technology (ICT), just-in-time (JIT))[52] and contribute to an ever rising share of procurement expenditures. The changing environment or context influences the tasks of the procurement function and the way these tasks have to be performed as well as the skills that are required for employees in the procurement function[23]. As these factors of influence changed over the last years, are changing at the moment and can be expected to change in the future, it seems reasonable to analyze how the procurement function and subsequently the necessary skill set for procurement professionals adapted to these changes over the last years and to verify how these trends and changes will affect the future of the procurement function and its professionals.

Therefore, this thesis aims at answering the following research question:

- How will the purchasing function change in the next ten years?
    1. What tasks will be important for the purchasing function?
    2. How will the purchasing function be organized in ten years?
    3. What education will purchasing professionals need?

4. What skills are required to fulfil the tasks of the purchasing function in ten years?

The topic is scanned regarding internal and external influencing factors causing changes in the purchasing function. The parameters are studied concerning their future development with the scope of 2025. However, to get a better understanding, also the current situation is analyzed. In order to determine the required skill set for the procurement function, the underlying processes and contents have to be analyzed regarding changes within the time scope of this thesis to derive changes in skill requirements. The impact of the organizational integration of the procurement function within a company for optimal supply chain integration and strategic supply chain decisions is researched as well.
Finally the research question includes a gender evaluation of the procurement function. Within the scope of this thesis a quantitative analyzis of differences in distribution of sex in the procurement function in the stated organizational levels is conducted.

In order to find a comprehensive answer for the research question, interviews with purchasing executives and professionals closely interacting with the purchasing function are conducted and subsequently analyzed using qualitative content analysis. Furthermore, a survey is conducted and analyzed statistically.

1.1 Structure of the thesis

This thesis is structured as follows:
Chapter two focuses on the available literature regarding the purchasing function in general, its organisation, the tasks of the purchasing function and the necessary training and education of purchasing personnel. Furthermore, external factors that have the potential to be of substantial importance for the future development of the purchasing function are analyzed.
Chapter three describes the methods that were used for the interviews as well as for the survey. Chapter three starts with a short introduction about suitable methods for such a study, explains why specific methods have been chosen and finally describes the chosen methods in greater detail.
Chapter four focuses on the results of the survey. In the first part, the statistical sample is being described, both, with regards to participating persons and participating companies. The second part shows the results of the questions that were asked in the survey. The third part focuses on relations between different data and evaluates whether factors like company size or supplier dependency have an impact on the development of a company's purchasing function.
Chapter five is a conclusion and discussion of the most important results and tries to see the results in the context of broader changes in our economy. Furthermore, the main results are summarized and interpreted.
The appendix shows the interview guideline, the survey questionnaire and statistical data.

CHAPTER 2

State of the art in purchasing

The the state of the art is researched in four dimensions as shown in figure 2.1: The tasks that have to be performed by purchasing employees are the first dimension, the second section analysis the organizational structure of the purchasing function, the third part focuses on the purchasing professionals, their necessary skillset, training and education and finally, the forth section describes the influence of external factors, focusing on the influence of globalisation and e-procurement.

Figure 2.1: Dimensions of the purchasing function

The way procurement is positioned and integrated in the organisation was subject to considerable change over the last years and also varies heavily from industry to industry and company to company. Cousins et al. [23] describe the evolution of the purchasing function from a "clerically-based function to a strategically focused process"[23, pp. 777]. They argue that procurement is increasingly seen as a value-adding function that is central to an organization's long-term success. They describe the development of procurement as evolutionary in a sense that the procurement configuration that fits best to a certain environment will "survive".[23] Based on a literature review they develop four characteristics that heavily influence different procurement configurations:

- Strategic Purchasing: As purchasing has an "increasingly pivotal role in the management of the firm's resources"[23, pp. 777] and contributes considerably to a company's success it gets increasingly accepted that procurement should be part of a company's strategic agenda.
- Status of the Purchasing function: Cousins et al. [23] define status as the way top-management perceives procurement[23]. Where procurement is considered strategic, it will have a higher status and receive more attention from top-management resulting in more available resources for developing the procurement function.
- Integration of the Purchasing function: A well-integrated procurement function will result in quicker problem solving, better information exchange and better levels of firm performance. A highly integrated procurement function can, therefore, be seen as an "indicator of a proactive and strategically aligned purchasing function, which is making a contribution to the firm's competitive advantage"[23, pp. 778].
- Skills of the Purchasing function: As stated above, the skills necessary for procurement professionals have changed considerably over time as the role has moved from being a buyer that focuses on price, quality and delivery to that of being a procurement professional that has to manage strategic long-term goals and complex agreements that are aligned with a company's strategy.

2.1 Purchasing tasks

The purchasing function has long been seen as a clerically based function that merely caries out tasks that have been defined by other, more strategic functions. [23, 35] As the nature of the purchasing function in many industrial companies has been changing rapidly in the past, the tasks that have to be performed by purchasing professionals are increasingly of strategic importance for the whole company.[100] Thus, the concept of strategic purchasing and strategic tasks of purchasing professionals has evolved[19] and the need to distinguish between "strategic tasks" and "operational tasks" has grown in importance[51]. Jahnukainen and Lahti [51] stretch that the "operative purchasing" and "strategic purchasing" (they focus on supplier management as an example of a strategic task) are "different in nature" and should therefore be separated.

Carr and Smeltzer [19] underline the importance of distinguishing between ”purchasing strategy” and ”strategic purchasing”. While the former refers to the way a specific purchasing task is carried out in order to achieve specific objectives, the later refers to ”the planning process purchasing follows as part of the strategic management process”.[19, pp. 200]. The following paragraphs aim to explain the terms ”strategic purchasing”, ”purchasing strategies” and ”operational purchasing”.

Jahnukainen and Lahti [51] define the term ”operative purchasing” as those task of the purchasing function that aim to take care of ”the on-line operations which take place during the delivery process”[51, pp. 107]. Thus, operative purchasing includes all tasks that aim to maximize the operational efficiency of all purchasing related activities

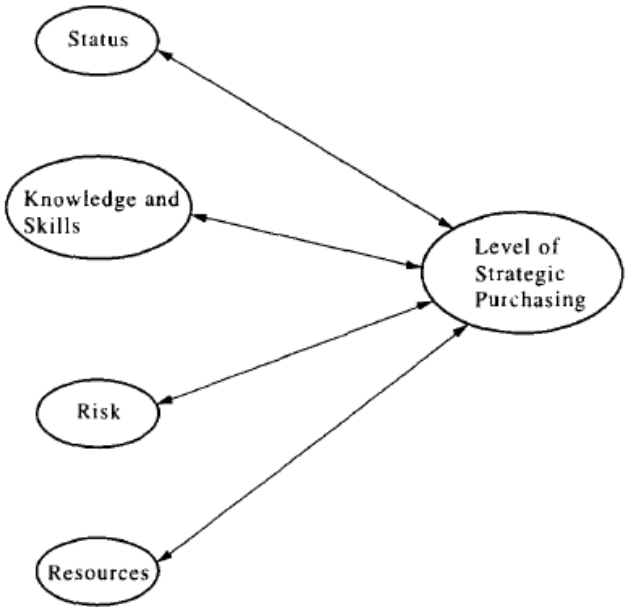

Figure 2.2: Strategic purchasing dimensions[19, pp. 202]

Carr and Smeltzer [19] define the term ”Strategic purchasing” as the ”process of planning, implementing, evaluating, and controlling strategic and operating purchasing decisions for directing all activities of the purchasing function toward opportunities consistent with the firm’s capabilities to achieve its long-term goals”[19, pp. 201]. Moreover, Carr and Smeltzer [19] develop a model consisting of four influencing factors that have an impact on the level of strategic purchasing as shown in figure 2.2. These factors include the capabilities, the available resources and skills. Furthermore, Carr and Smeltzer [19] hypothesize and later empirically prove that there is positive correlation between the level of ”strategic purchasing” activities in a firm and its internal status. Although, they leave it unclear whether the status of the purchasing function depends on the level ”strategic purchasing” performed or vice versa, it is necessary to recognize

that there is a positive relationship between those two factors.
The research of Ellram and Carr [33] identifies three key questions for ”strategic purchasing”:

1 What are the key strategic issues and options for the purchasing function?
Based on a literature review, Ellram and Carr [33] conclude that the key strategic issues the purchasing function must be concerned with are (1) the make-or-buy decision, (2) supplier technology questions, (3) the question which relationship to suppliers is desirable, (4) questions concerning the external sourcing market and (5) the question what purchasing can contribute to a company' competitive advantage.
Especially Jahnukainen and Lahti [51] underline that a sourcing policy that clearly defines responsibilities in the make-or-buy decision is not only important in terms of keeping key capabilities in-house but is also a necessary requirement for a possible subsequent integration of key-suppliers.
This chapter focusses more on the ”purchasing strategy” and less on ”strategic purchasing” as explained by Carr and Smeltzer [19].

2 Should the purchasing be integrated in the strategic management process and what is its contribution?
The research of Ellram and Carr [33] clearly shows that the purchasing function should be included into the corporate strategic management process. Suppliers increasingly play a pivotal role in supporting a firms competitive strategy, thus increasing the importance of the purchasing function as a key interface to the suppliers. Furthermore, the purchasing function supports the corporate strategy through selecting suppliers that are capable to support a company's strategic agenda. Moreover, enabling suppliers to grow in their capabilities in order to support a company strategically is a crucial contribution of the purchasing function to a company's strategic management process.[33]

3 Is the purchasing function perceived to be strategic?
Ellram and Carr [33] argue that the purchasing function can be perceived to be strategic when top-management recognizes and accepts the importance of the purchasing function for the strategic management process. This status should be operationalized as well.

2.1.1 The make-or-buy decision

The make-or-buy decision represents one of the most crucial steps in the production planning and manufacturing process for many manufacturing companies. Therefore, it is one of the most important tasks of ”strategic purchasing” to participate in this decision[33]. Having to recognize the importance of strategic factors - a loss of manufacturing know-how or other intangible assets for instance- as well as economic issues - manufacturing costs or sourcing prices- the make-or-buy decision is driven by a number of different and in many cases conflictive factors of influence. Therefore, a properly defined make-or-buy process that appropriately takes into account all kinds of trade-offs between strategic and economical factors, proves to be a great asset for any manufacturing based company. Especially as the globalization allows us to efficiently use the competitive advantage of manufacturing in low-wage countries, a well defined

make-or-buy process is vital for any manufacturing company that wants to fully leverage the advantages of the latest sourcing strategies in order to compete in an ever more competitive market.

The decision of what to make and what to buy is a major challenge every manufacturing company has to face at a certain point during the production planning process. There are basically two groups of factors that influence this decision: Strategic factors and economic factors. Strategic factors of influence include all reasons to manufacture a single part, a sub-assembly or a whole product in-house for reasons other than the mere production costs. Economical reasons represent all reasons related to production cost and sourcing price.

The make-or-buy decision is certainly a dilemma as old as the manufacturing industry. However, while the above mentioned economical factors have been part of companies' considerations for a long time already, the more difficult to quantify strategic reasons have not been taken into account so extensively.[83] In many cases companies have neither properly defined strategic reasons nor have they built up a framework that describes how to handle the many trade-offs between strategic and economical factors.

Reasons why companies review their make-or-buy decision include the wish to concentrate resources on core competencies, a shift in the capabilities of the supply chain or the wish to lower the break-even point.[88] Furthermore, many manufacturing companies face considerable challenges whenever they do not have the necessary capacity to manufacture products in-house that should not be sourced for strategic reasons. Instead of denying an order or investing in new machinery, many companies opt for diluting their make-or-buy policy.

The goal of this section of the thesis is to summarize the drivers and triggers behind the make-or-buy decision, point out trade-offs between the factors of influence, discuss the advantages and disadvantages of different aspects of the make-or-buy process and finally underline the importance of taking into account the make-or-buy decision in an early stage of product development.

Triggers and drivers behind the make-or-buy decision are many and various. As stated above and shown in figure 2.3 on the next page, there are two basic groups of factors that affect the make-or-buy decision: Strategic reasons and economic reasons. In the majority of cases the principal trigger for this decision is the wish to reduce cost. Therefore, cost reduction should be the key performance indicator for most make-or-buy decisions.[88] As many companies do not have a proper framework of how to address those issues but do decide primarily on the basis of overhead costs,[74] it seems necessary to briefly summarize the most important drivers behind the make-or-buy decision:

Strategic issues that affect the make-or-buy decision include the following:

1 Does the capacity necessary for in-house manufacturing exist?

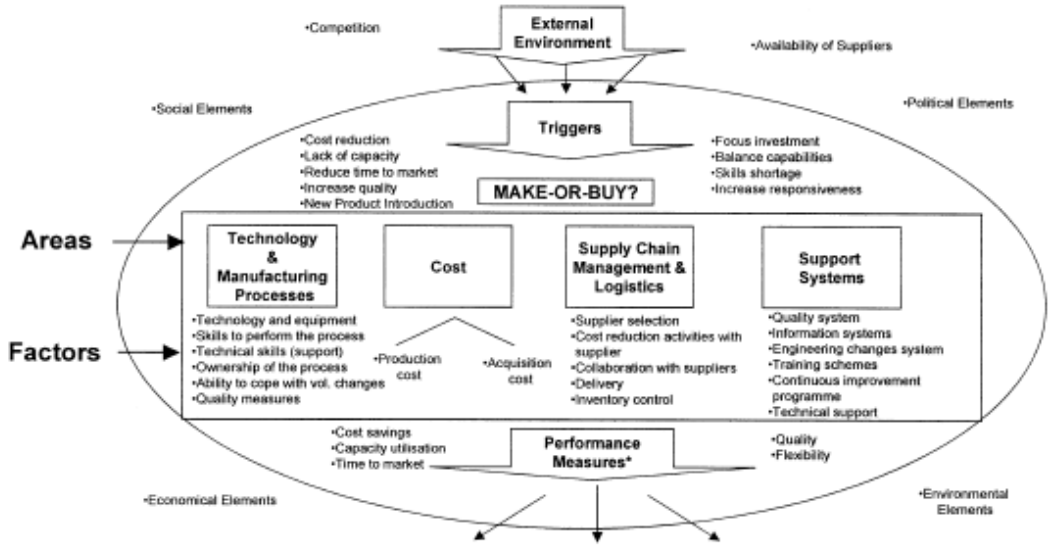

Figure 2.3: A framework for a make-or-buy decision[18, pp. 1322]

2 Does the know-how exist to manufacture in-house?

3 Are the manufacturing technologies and processes involved in the creation of a certain part or assembly part of the company's core competencies?

4 Is it possible to source assemblies or whole products or is there a danger that suppliers leverage manufacturing know-how and become system providers themselves?

5 Is there a danger that suppliers use the transferred know-how in order to strengthen a direct competitor?

Another point that needs to be critically reviewed is the link between the make-or-buy decision and the investment policy. Many companies that try to minimize their capital expenditures tend to modify their make-or-buy policy whenever capital expenditures for investments in machines would be required, thus reducing the make-or-buy policy to absurdity. Therefore, the need to focus investments on core activities might also constitute the trigger for a review of the make-or-buy decision in some cases.[88]

Economical considerations are largely based on the objective of obtaining the best price while taking into account only a few additional factors like quality and delivery issues.[74] However, it is necessary to implement an in-depth analysis of supplier's capabilities to manufacture a certain part or assembly in order to achieve a solution that properly reflects all factors of influence. In case a company does not thoroughly assess the capabilities of suppliers there is a high risk that cost related to a lack in quality will reduce or even overcomes a possible cost

advantages. Therefore, an effective supplier development program can be seen as a necessary requirement for fully leveraging the cost-saving potential of the make-or-buy decision.

Moreover, companies that fail to take into account factors other than price tend to increasingly erode their own core competencies.[45] Core competence is defined as a kind of competence that fulfils three criteria: It contributes significantly to the customers' benefit from the product, it is competitively unique, and provides potential access to a wide variety of markets.[67]

Additionally, it is necessary to define and set targets on cost reductions in case a company plans to change its current manufacturing structure (from in-house to sourcing or vice versa). Obviously, many companies consider outsourcing more as a method to cut their short-term cost basis and less as a valuable part of their long-term strategic plans.[74]
Furthermore, there are a few more key issues that heavily influence the success of make-or-buy decisions and therefore need to be part of the decision-making process:

1 The involvement of a multi-disciplinary team in the decision-making process: To get inputs from various areas of expertise seems to be the best way to make sure that all the information necessary for the make-or-buy process is available and no major factor of influence is neglected.[83]Furthermore, this is the easiest way to avoid that particular interests of certain groups are being overrepresented in the decision-making process (e.g. the manufacturing department aims at fully utilizing its capacity while the purchasing department focuses on maximizing its incentives through buying at the lowest possible price without taking cost of quality into consideration).

2 The structure and documentation of the decision-making process: To carry out the process in a structured manner and document the process through minutes and project briefings. These documents are very helpful in addressing possible issues encountered during the out- or in-sourcing process.[83]

3 It has to be considered that in many cases the supply chain is already established, therefore the extent of horizontal and vertical integration cannot be defined by a purely analysis based decision. In most cases, the structure of the supply chain is likely to be defined through a number of past, short-term oriented decision and less through long-term strategic considerations.[74]

Trade-offs between strategic and economical factors are what makes the make-or-buy process a many times conflictive issue. Obviously, there are certain trade-offs between the more short-term oriented economical factors of influence and the mostly mid- to long-term oriented strategic factors. In the following part, two of the major trade-offs are being discussed a little bit more detailed:

The single most important trade-off to be explained has already been indicated above: A make-or-buy policy focused solely or too much on short-term financial goals tends to erode the core competences and therefore the competitive advantage of manufacturing companies (and

perhaps of any company). Due to the fact that many companies ”unknowingly relinquished their core competences by cutting internal investment in what they mistakenly thought were ’cost centres’ in favour of outside suppliers”[74, pp. 171], it has to be underlined that not considering this strategic aspect might expose a company to considerable risk of diluting its own business model. In this context, the enormous importance of developing employees in order to gain an sustainable competitive advantage has to be mentioned. Outsourcing typically provides a quick and relatively easy way of cutting down cost but may lead to an erosion of the capabilities that collectively constitute the core competences of a company.[104]

Another important trade-off that has to be balanced is the one between the corporate goal to minimize capital expenditures and the aim to preserve know-how through keeping most of the manufacturing capabilities in-house. It has to be acknowledged that in a time were the majority of corporate insolvencies is caused by a lack of liquidity, the importance of minimizing capital expenditures should not be underestimated. On the other hand, it is of big and increasing importance to preserve competitive advantages that are based on companies’ manufacturing know-how. It is one core function of the make-or-buy process to balance these conflictive factors in a way that allows companies to exploit their full profitability potential while still keeping in mind the long term perspectives.

The question how and when the make-or-buy process should be applied during the product development process is quite important as it has consequences on the whole design process. An early application of the make-or-buy process has the advantage that product properties can be tailor made in order to suit the requirements of a certain supplier and consider capabilities of in-house manufacturing units. Therefore, it can be assumed that the cost reduction caused by a properly designed and applied make-or-buy process increases the earlier it is conducted during the product development process. However, it has to be considered that these advantages come for the price of reduced flexibility with regards to sourcing strategies: Parts or assemblies which are designed to fit the special needs of a certain supplier might cause considerable problems for other manufacturing companies and decrease the bargaining power of the buying organization.

To summarize ,the make-or-buy decision is not only a question of cost and price but also an issues that has consequences for the corporate strategy. Therefore, an in-depth analysis of the factors of influence indicated above promises to greatly contribute to a balanced decision that bears in mind strategic, long-term related factors of influence as well as more short-term related financial goals. Moreover, incorporating the make-or-buy decision in an early stage of product development already will improve the efficiency of the process significantly, as product properties might be specifically adapted to the needs and capabilities of suppliers or in-house manufacturing units.

Finally, it has to be considered that there might be completely different approaches of how to handle what we now call the ”make-or-buy decision”. The Toyota Production System, role model for many production systems world-wide, tries to see this question in a much broader

context, making the classical approach nearly irrelevant. About the founder of the Toyota Production System it is said, that ”the make-or-buy decision that occasioned so much debate in mass construction firms struck Ohno and others at Toyota as largely irrelevant, as they began to consider obtaining components for cars and trucks. The real question was how the assembler and the suppliers could work smoothly together to reduce costs and improve quality, whatever formal, legal relationship they might have.” [109, pp. 58]

Therefore, it can be assumed that we still have not found the ultimate approach to handle the strategic and financial dilemma of the make-or-buy decision or that there might not be a single best solution. In fact, the final conclusion might be that the make-or-buy decision is too complex for a standard approach but requires tailor-made solutions for different markets, different industries and different companies.

2.1.2 Supplier management: Supplier selection and evaluation

Supplier selection is part of supplier management which is one of the key tasks of Supply Chain Management[65]. Supplier management activities go far beyond of what is traditionally considered ”procurement”. However, as ”procurement” is increasingly seen in a bigger context, supplier management can be seen as one of the key aspects of ”strategic purchasing”.
Per definition, Supply Chain Management is the ”the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole”[21, pp. 5] and Supplier management is part of the upstream activities of Supply Chain Management.
The benefits of Supplier management go far beyond reducing costs in the upstream part of the Supply Chain and include the possibility to efficiently use just-in-time production and delivery systems[21], help improve quality of the supplied goods[57] and is certainly very important for efficiently including suppliers in the product development process[90].
Supplier management includes the the tasks of supplier selection, supplier evaluation, supplier development, supplier integration and supplier relationship management. The key parts of the supplier management cycle are shown in figure 2.4 on the following page.

Huang and Keskar [48] underline that research on supplier selection topics started as early as in the 1960s and has since been treated either as a strategic decision making problem or as an optimization problem. Treating supplier selection problems as an optimization problem has been the method of choice for most scholars, however, it requires target indicators to be defined and subsequently a function to be optimized with regards to the predefined indicators thus neglecting questions of the strategic fit between product characteristics and supplier performance metrics [48].
Traditionally, there have been three indicators used for selecting suppliers: price, delivery performance and quality[98]. Service has been used as a fourth criteria to supplier selection [103]. The relative importance of these factors has changed over time, as has the nature of the purchasing function itself. While price has been the most important factor in ”primitive” purchasing organisations(meaning clerically based purchasing organizations)[64], the other factors have evolved to be more decisive in modern purchasing organizations [108].
Choi and Hartley [20] have analyzed more than 20 aspects that have an impact on supplier selec-

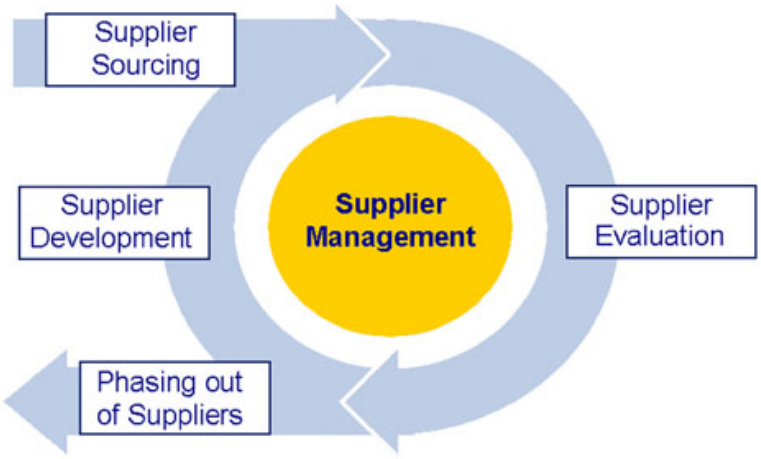

Figure 2.4: A framework for supplier management[1]

tion and have come to the conclusion that price is one of the least important factors, regardless of the position of the company in the supply chain. Furthermore, they present empirical evidence that quality grows in importance, however, the term quality goes beyond the quality of products in this context and also includes the quality of the relationship to the supplier.
As the supplier selection process gets more and more complex and increasingly incorporates intangible aspects in the decision making process, de Boer [29] argues that a cross-functional decision-making unit is best suited for managing the supplier selection process.(compare 2.2.3 on page 34)

While supplier selection aims at finding a scheme to efficiently select possible supplier, supplier evaluation is the task of assessing the performance of an already existing supplier in terms of achieving the pre-defined, clearly measurable goals set by the purchasing organisation. Both use mostly the same methods, however, due to the increasing amount of data, supplier selection allows to assess the supplier performance more detailed than what is possible during supplier selection.
However, as the task of supplier evaluation has grown in complexity due to the internationalization of supply chains, decreasing time-to-market and rising outsourcing volumes among others, more criteria have emerged that need to be considered. As the criteria for supplier evaluation are in most cases very similar to the ones used for supplier selection, they should not be described more detailed.

2.1.3 Supplier management: Supplier development

As stated in 2.1.2 on the preceding page supplier development is part of supplier management activities. Watts and Hahn [106] define the term supplier development as a ”a long-term cooperative effort between a buying firm and its suppliers to upgrade the suppliers’ technical, quality, delivery, and cost capabilities and to foster ongoing improvements”[106, pp. 12]. Similarly to

Watts and Hahn [106], Wagner [105] defines supplier development as the task of ”supporting the supplier in enhancing the performance of their products and services or improving the supplier’s capabilities”[105, ppp. 555].

Reasons that make firms trying to develop their suppliers include the following[105]:

1. As outsourcing costs gain importance compared to other types of cost, firms are no longer capable of limiting cost saving initiatives at the boundaries of their own firm but must aim to leverage such initiatives in the whole supply chain.

2. Specialized competencies that are required might not be readily available on the supplier market.

3. The performance of certain suppliers might not be regarded as sufficient.

While there are other ways of facing the above mentioned issues (switching the supplier or vertically integrating them), supplier development certainly has a few advantages: Switching the supplier is only possible if there is a supplier with the required capabilities readily available while vertical integration requires substantial capital investments. Therefore, supplier development certainly is the method of choice in most cases[105].

Krause et al. [60] identify two different types of approaches towards supplier development which should be explained a little more detailed in the next section.

The reactive approach identifies deficiencies in the performance of the products or services that a certain supplier delivers through the use of supplier evaluation tools. In order to correct these deficiencies or as a result of complaints by the firms customers, supplier development measures are carried out. As these measures are reactive and are only carried out after problems have already occurred, reactive supplier development can be classified as less systematic than strategic supplier development.
Therefore, reactive supplier development focuses on improving a single supplier through a supplier development project. The supplier to be developed does typically not have to be selected actively but the supplier is self-selected due to a lack of capability or quality.[60]

Companies that use the strategic approach towards supplier development try to evaluate commodities and suppliers that are critical for the long-term success of a company and subsequently do whatever is necessary to help develop them. Therefore, the strategic approach does not aim at using supplier development as a tool to solve short-term problems but use is as an initiative for creating a supplier base that help the company gain a long-term competitive advantage. The strategic approach is the most advanced supplier development strategy as shown in figure 2.5 on the next page.
While reactive supplier development is usually performed by means of a supplier development project that focuses on one specific supplier, strategic supplier development is carried out through a broader more general approach that aims at developing the capabilities of the supplier base as a whole.

Therefore, strategic supplier development is typically conducted by means of initiating a supplier development program that focuses its development efforts on the most crucial suppliers in terms of strategic importance.[60]

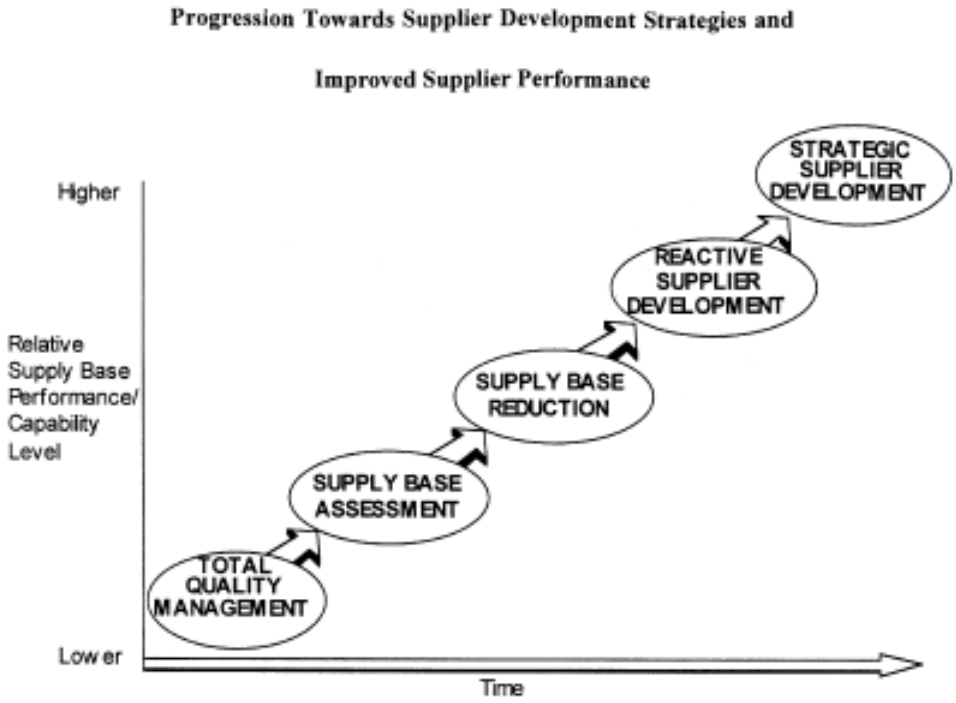

Figure 2.5: Supplier development strategies[60, pp. 44]

To efficiently carry out a strategic supplier development program, it is necessary to focus the existing resources on developing the most crucial supplier in order to get the best possible return. In order to do so, Krause et al. [60] suggest to use a ten step process that aims systematically incorporate a continuous improvement policy at key-suppliers as shown in figure 2.6 on the facing page:

The first step is to identify critical commodities. This step aims at evaluating the relative importance of the commodities a company buys. In order to assess all commodities in a structured way, Kraljic [59] proposes a two dimensional model that defines commodity importance in two dimensions:

- The importance of purchasing defined through a composite index that includes indicators like the strategic importance in terms of value-added, the percentage of raw materials in total costs and the impact on profitability.
- The complexity of the supply market defined through an index that includes indicators such as supply scarcity, pace of technology, entry barriers, logistic costs and monopoly

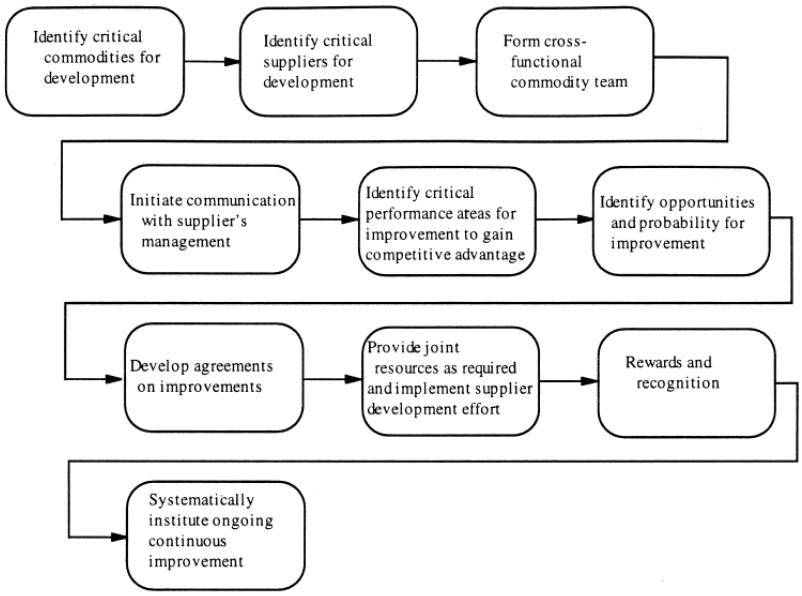

Figure 2.6: A framework for supplier development[60, pp. 44]

conditions.

Depending on their position in the resulting classification portfolio, Kraljic [59] categorize the commodities in four different types: non-critical commodities, bottleneck commodities, leverage commodities and strategic commodities whereby strategic commodities are those of high importance in a complex sourcing market. Therefore, it is suggested to focus resources on those commodities that are of strategic importance.
The second step is to identify critical suppliers. In order to identify critical suppliers, the performance of suppliers needs to be assessed systematically. Furthermore, benchmarking the supplier performance to world-class supplier performance is suggested. Suppliers that provide a company with critical commodities and have deficiencies with regards to their performance are suggested to be developed.
Subsequently, cross-functional commodity / supplier teams need to be formed for conducting supplier development efforts. Furthermore, Krause et al. [60] suggest to use " pre-established, dedicated and separately funded cross-functional teams to improve the overall performance of the supply base"[60, pp. 48].
The next step is to initiate communication with supplier's management. This step aims at approaching the supplier in order to align with him on possible measures. It is essential to emphasize that those initiative do not aim at improving the performance but are carried out in order to "jointly [to] improve the flow of materials, services and information between the supplier and buying firm for mutual benefit"[60, pp. 49].
Critical areas for joint improvement in order to gain competitive advantage can include but are not limited to issues like joint-development projects, improvements in fulfilling end-costumer

expectation, standardization of parts and processes, process mapping for identifying quality problems or the development of joint information technologies.
Once possible opportunities for improvement have been identified, they should be evaluated with regards to feasibility, required resources, required time and potential return on investment. Furthermore, a risk assessment should be conducted.
As the best initiatives have been identified, concrete and measurable targets for performance improvement should be set. These targets should be split up in milestones and responsibilities for the different phases of the project should be determined.
When all initiatives are properly determined, those responsible for carrying them out should be provided with the required resources in order to implement the measures. In order to be successful, it is essential that both parties involved, the supplier and the buyer, benefit from the implementation of the project.
In order to promote joint performance improvement initiatives it is important to have a recognition program that aims at formally rewarding those involved in a successful supplier development program.
The last step aims at stabilizing performance improvements: The progress must be observed and tracked over time, goals must be set and progress must be openly communicated.

2.1.4 Supplier Integration

While the involvement of suppliers in the product development process and the role of the procurement function will be reviewed in greater detail in 2.1.7 on page 22, the integration of suppliers in terms of the more operative aspects of the business, e.g. manufacturing planning and delivery can be seen as part of supplier management.
Das et al. [27] define supplier integration as ”a state of syncreticism among the supplier, purchasing and manufacturing constituents of an organization”[27, pp. 564] and argue that supplier integraton is ”motivated by the recognition of interdependency”[27, pp. 564] between the tasks of the supplier and the buyer. As the level of vertical integration of companies has consistently decreased in the last decades, the need to integrate suppliers has risen.
Mechanisms that can be used for supplier integration include tools such as electronic data interchange (EDI), web-based interfaces, enterprise resource planning (ERP) software that is interconnected or workshops that are conducted (e.g. collaborative cost reduction workshops).[27, 96] Das et al. [27] note that it is necessary to distinguish between initiatives that are capable of generating long-lasting rents and such that do not. Furthermore, the integration mechanisms can be split in mechanisms that involve advanced IT and mechanisms that rely on ”knowledge generating resources such as cross-functional teams or collective problem solving”[27]. While the former method of integration is usually applied for integration efforts that aim at specific products, the later focuses usually on activities that are more complex, require a higher level of creativity and involve some kind of tacit knowledge.[27]

As the integration of suppliers is a quite common practice, companies seem to have decided for themselves that there are certainly occasions where the advantages of supplier integration practices overcompensate its disadvantages. These advantages include the following:

- Supplier integration decreases transaction costs: Supplier integration activities can be seen in the context of transaction cost theory as suggested by Coase [22] and be categorized as a hybrid governance structure that has characteristics of a market based approach as well as one that is mainly coordinated through a hierarchy. As supplier integration causes an increased level of coordination, quicker and more intensive information exchange that will usually lead to an increased level of trust and a lower risk of opportunistic behaviour between the various partners.

- Supplier integration decreases the need to integrate vertically: In many cases, the question is not to integrate suppliers or not but to either increase the level of integration of suppliers or increase the vertical integration of the company. In such a scenario, supplier integration is the choice that allows the buying company to integrate while still limiting the required financial investments that are necessary for vertically extending operations. Therefore, hybrid organisational models such as supplier integration allow companies to have many of the benefits associated with total integration while still limiting the risks and inflexibility involved.[27]

- Supplier integration will usually result in a supply base reduction as resources are channelled towards promising suppliers that are subsequently integrated more tightly. Such a supplier base reduction will cause the remaining suppliers to deliver increased volumes which will in many cases cause increased business performance.[27]

While the positive implications of supplier integration usually overcompensate possible negative consequences, it should certainly be mentioned that there are negative implications of supplier integration as well. These consequences include the following:

- Inflexibility: Scholars have stretched that a higher level of interdependency can create inflexibility thus limiting the firms capacity to quickly react to changes in environment.[47] Thus, it can be reasoned that the level of supplier integration should be limited for companies that have to operate in an environment that features a high level of uncertainty.

- Increased coordination needs: Certainly, a higher level of supplier integration requires a more sophisticated approach to coordination. Therefore, additional resources are required for coordinating the supplier integration.[27]

- Increased level of compromise: Supplier integration usually restricts employees in their decision-making process and requires them to accept compromises. Therefore, the capability of employees to think critically and use their creativity for innovative problem-solving solutions can be affected negatively by supplier integration initiatives.

Das et al. [27] stretch that the returns of supplier integration initiatives usually follow the laws of diminishing results: While the benefits of supplier integration will be substantial for the initiatives that are introduced at the beginning of the supplier integration project, the returns will get smaller and smaller for every measure that is being implemented as the level of integration increases.

2.1.5 Supplier relationship management

As outsourcing volumes have been increasing over the last decades, steps in the value chain that have been vertically integrated are conducted by suppliers today. As indicated in 2.1.4 on page 16, these developments have in some cases lead to a more integrated relationship with suppliers that usually aims at collaborating for the mutual benefit. However, such approaches require substantial communication and coordination efforts. Supplier relationship management (SRM) therefore aims at finding a holistic approach towards planning, implementation and controlling of collaboration activities with suppliers. In order to integrate the suppliers in the relevant processes, supplier relationship management aims at providing the required tools and methods to support the relationship with the supplier throughout the whole supplier life cycle. While supplier relationship management activities include usually direct supplier only, it might be required to involve suppliers of suppliers or even raw material suppliers in case of particularly critical commodities.[44]

The SRM system is primarily a support tool that aims to improve the interface between the buyer and the supplier during the whole supplier life cycle. Große-Wilde [44] suggest to use a two dimensional model to describe the components and instruments of a SRM system:

- Support strategic purchasing tasks (”sourcing support”):
  The SRM system aims to support the supplier selection process. The support of the SRM system can include initiatives like supporting automated requests for information (RFI), requests for quotation (RFQ) or requests for proposals (RFP). Furthermore, existing suppliers can be matched with the sourcing needs in order to find whether there are existing suppliers that are capable of meeting the new sourcing demands. The same procedure can be used for supplier evaluation as well. Furthermore, supplier selection and evaluation processes can include self-assessment tools that allow the supplier to evaluate his own performance and communicate it via the SRM platform.
  Furthermore, SRM systems supports the sourcing of more complex commodities as well. Such commodities might demand closer cooperation. SRM systems can for example support the use of simultaneous engineering measures.
  For more standardized commodities that feature not shortage of possible suppliers, tools like reverse auctioning can be included in the SRM software.
  Moreover, advanced forecasting instruments can be used to collaboratively reduce inventory cost in the whole supply chain.

- Support operative purchasing tasks (”procurement support”):
  Procurement support by SRM systems includes instruments like electronic payment systems or so called desktop-purchasing-systems that allow the units that need the commodities in question to order them directly from the supplier without purchasing involvement.

2.1.6 Supplier market research

In the past, scholars have often reduced supplier market research to supplier searching activities. However, systematic supplier market research activities are essential for creating a foundation

where subsequent strategic purchasing activities can be based on and go therefore far beyond traditional supplier search activities.
Supplier market research is a core process of strategic procurement activities and includes all activities that aim to systematically gather, edit and analyse data concerning supplier markets. Supplier market research aims at creating a information base that allows to conduct strategic buying decisions in a transparent way.[97]
Moreover, the tasks of supplier market research go beyond general market investigations and also include the research on specific market information like market mechanisms, market structure or market participants. Supplier market research activities are either carried out continuously or with a specific, temporary limited goal.[97]
Within strategic purchasing management, supplier market research aims at creating a base for subsequent activities like supplier selection, supplier development or supplier base reduction.[97]

Goals of supplier market research are many and various. As stated in the definition, supplier market research aims at systematically supporting subsequent strategic purchasing activities with supplier market information.
Schuh et al. [97] suggest that supplier market information can be classified in eight categories: General market information,product or performance related information, price related information, information related to the supplier side of the market, information related to the customer side of the market, information related to the market environment, information related to substitute product markets, information related to intermediate product markets

Compared to sales market analysis, supplier market analysis activities usually have to cover a higher number of different, heterogeneous markets. Hence, even for big corporations it is nearly impossible to deeply analyse all relevant supplier markets as the required effort to do so could not be compensated by the potential benefits.[97]

Therefore, a process is required that aims at selecting and prioritizing the supplier markets to be investigated in greater depth. Schuh et al. [97] suggest to use a four step approach that distinguishes between market analyses (first and second process step) and market observations activities (third and forth process step):

1. Determine information requirements
   The first step aims at determining information requirements for properly carrying out the supplier market research activities. This step includes determining the relevant market which usually involves facing the trade-off between narrowing the relevant market which reduces costs and required efforts but creates the danger of not analysing relevant parts of the market and defining the relevant market more broadly which creates the danger of using too many resources.
   Schuh et al. [97] suggest to use three criteria - geographical focus, cost and performance - as indicators for determining the relevant market. Optionally, factors like production technology or material technology can be added as additional factors.

Furthermore, it is advisable to conduct an environmental and a stakeholder analysis in order to define and analyse all relevant players and external factors of influence. Moreover, it is necessary to include competing buyers in the analysis as well as suppliers of possible substitute products.
The power structure of the different participants is of imminent importance for the process, notably for the sourcing of standardized products and should therefore be conducted as well.
To summarize, there are two different groups of factors of influence that need to be considered: macro factors and micro factors.

- Macro factors influence a whole market or many markets and can be of environmental, economical, legal, political or social nature. They are of high importance but in many cases it is neither feasible to consider all of them in detail, nor is it necessary in some cases. However, critical macro factors like political stability in a geographical region need to be considered.
- Micro factors are factors of influence that affect one company and its immediate environment. Such factors include but are not limited to performance, quantity, cost, risk or market structure indicators.

2. Gather information
In order to gather the required information, two types of sources can be used:

- Primary sources are used when the required information can not be collected from existing sources. Therefore, market research methods are used to collect specific pieces of information.
- Secondary sources include newspaper, scientific and non-scientific articles, purchasing associations, supplier visits or banks and are normally the source of choice as they require far less resources than primary sources.

In many cases, the amount of available information will be very large and therefore require advanced software tools in order to properly deal with them.

3. Evaluate information
The information that has been collected has to be condensed, evaluated and interpreted. If necessary, the plausibility of data and relations between different indicators have to be evaluated.
Even if the original amount of information has already been condensed, the information has to be further screened with regards to the quality of the input data and the relevance of the data.
In general, the amount of available data depends on the supplier market in question. In case of ”exotic” markets, the available amount of information might be very limited, thus requiring information of unclear descent to be considered for further evaluation. In such cases, the purchasing personnel must evaluate whether the sources are acceptable.
Based on the evaluation of the information projections about future developments in the

respective markets can be conducted. Market projections try to predict future developments through analysing past developments. Therefore, it is a major requirement for a successful prediction to thoroughly understand past developments in order to avoid misinterpreting data. Furthermore, it needs to be considered that such projections always include a certain level of uncertainty which generally depends on the quality of the available data, the uncertainty and complexity of the market in question and the qualification of the personnel conducting the projection.

4. Communicate findings
   In order to efficiently communicate the outcome of the supplier market analysis, it needs to be considered what channels of communication are used for publishing the outcome of the supplier market analysis, who should be informed and what information should be communicated.
   The findings of the supplier market research activities should not be restricted to those who are in charge of making supplier related decisions but also be made available to anyone within a company interested in the topic.

Schuh et al. [97] consider the following methods to be relevant for supplier market analysis activities:

- Porter's five forces
  The famous concept of the five forces, introduced by Porter [84] and commonly known as "Porter's five forces" is suggested to be used for supplier market analysis. As the concept of the five forces is well known and has been reviewed in detail many times, it should not be described in depth in the thesis.

- Information gathering
  As indicated above, there are two different ways of information gathering: Making use of primary sources or making use of secondary sources.

  1. Primary resources include all resources that have not yet been exploited. Methods for making use primary sources include surveys, polls, questioning and observations. Questioning can be done orally, written or computer based. Observations can be conducted in reality or by observing laboratory processes.
  2. Secondary resources include internal and external documents that are already existing. Methods for data gathering include data mining, text mining and web mining.

- Information evaluation
  Methods for evaluating information are used to structure information and determine relations between different data. Information evaluation methods can be distinguished in statistical methods, non-statistical methods and prediction methods.

- Information communication

2.1.7 Integration in product development

As this thesis aims to verify how the role of the purchasing function changes in industrial organizations, the level of involvement of the purchasing function in the product development processes is something that needs to be evaluated.
Especially industrial companies increasingly rely on product innovation in order to gain competitive advantages. Therefore, the integration of the purchasing function into the product development process is rapidly gaining importance.[110]

Furthermore, many companies are trying to involve suppliers into product development as well as long-term research activities. Naturally, as the primary interface to the supplier, the purchasing function has an important role in this process.[91]

Wynstra et al. [110] use a three dimension model (rationalization, structure, development) in order to get a better understanding of what leads to the trend to involve the purchasing function and possible suppliers at an early stage of product development:

1. Rationalization refers to the responsibility of the purchasing function to help a company gain competitive advantage through realizing low purchasing cost.

2. Structure describes the task of the purchasing function to define the structure of the supplier network and influence the level of dependency on specific supplier.

3. Development is related to the influence the purchasing function has on developing technological skills and development through choosing and developing the right suppliers and properly exploiting existing technological capabilities of suppliers.

Wynstra et al. [110] stretch that these three dimensions cannot be seen independently and are partially overlapping. They conclude therefore that the ”the integration of purchasing in the product development process has to be based not only on purchasing’s development role, but also on the rationalization and structure roles”[110, pp. 69]. Furthermore, Wynstra et al. [110] stretch that the impact of the purchasing function on the product development process should be seen independently of the involvement of suppliers.[81]

Traditionally, the role of the purchasing function in new product development (NPD) projects was to ensure that all external inputs are delivered in time in the right quantity and quality and are reasonably priced. Thus, the purchasing function’s task was to select suppliers for the project that would be capable of fulfilling those requirements.[75, 110].
However, as suppliers get increasingly involved in the development process itself instead of merely executing the outcome of the development process, the role of the purchasing function changes as well and gets increasingly strategic. Involving suppliers in product development processes not only gives them the chance to influence the design but also limits the buyer in its possibility to choose suppliers for the production of the product as the buying firm is usually tied to the firm involved in the development process. Thus, such an involvement changes the power relationship between the buyer and the supplier.[46, 75] Moreover, the supplier best suited for

involvement in the product development process might not be the one best suited for producing the items in question.[93]

In order to better understand the tasks of the purchasing function in the product development, Melander and Lakemond [75] have split the tasks in three categories:

1. Purchasing's role in technology selection:
   Technology selection has a huge impact on the possible supplier selection processes as it limits the pool of possible suppliers[46]. In many cases, companies at one point have to decide whether they want to rely on components that are based on the use of proven technology or if they aim to achieve superior overall product characteristics through the use of technologies that are not yet fully proven[61]. In case a company decides to do so, a situation of technological uncertainty arises. Oh and Rhee [80] stretch that increasing technological uncertainty makes it more attractive for companies to develop in-house as the transaction costs involved with coordinating the developing efforts with the supplier make it uneconomical to outsource in situations of strong technological uncertainty. Figure 2.7 shows the various factors of influence on joint product development processes and its interaction.

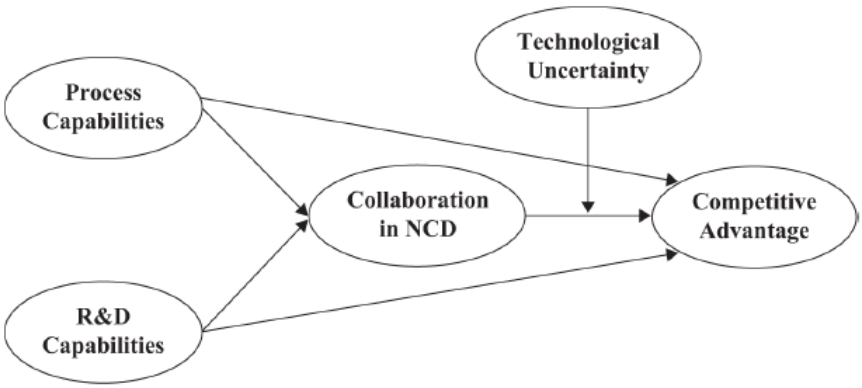

Figure 2.7: Influence of technological uncertainty on joint product development[80, pp. 758]

2. Purchasing's role in supplier selection:
   Purchasing's role goes beyond selecting suppliers that have the required capabilities and also includes incorporating know-how about prior developing assignments with specific suppliers. These measures aim at identifying capable suppliers that have a track-record of successful collaboration[73].
   As there might not be suppliers with a proven track-record available for new development products, purchasing is required to provide a shortlist of possible suppliers in that case. The supplier selection decision can than be based on a multiple criteria decision analysis as indicated in 2.1.2 on page 11 [80].

3. Purchasing's participation on the NPD project:
   Melander and Lakemond [75] stretch that the purchasing function is the most important participator in NPDs besides the R&D department.
   The role of the purchasing function can be evaluated in two dimensions:

   - The purchasing function's role in solving routine problems:
     Such problems include cost issues, problems concerning utility, delivery and payment where the purchasing function's task is to be a facilitator, negotiator and communicator.
   - The purchasing function's role in keeping the internal organization up to date:
     The second aspect refers to the responsibility of the purchasing function to provide cross-functional leadership. Melander and Lakemond [75] stretch that the responsibility of the purchasing function can include "sharing important information and intent, as well as involvement on the evaluations of the new technology, discussion on specification and early quality assurance"[75, pp. 5] as well.

Based on a empirical study, Wynstra et al. [110] develop a two dimensional (level of management and level of responsibility) model for the level of involvement of the purchasing function in product development and subsequently synthesize these dimensions in a framework (compare figure 2.8).

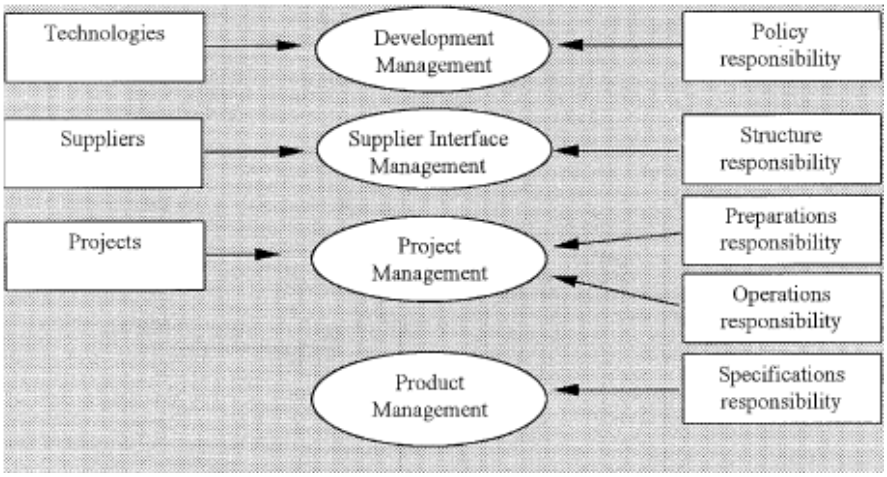

Figure 2.8: A framework for assessing purchasing involvement in R&D processes[110, pp. 77]

The first dimension, management levels, consist of three different activities: projects, suppliers and technologies.

1. The activity "Projects" focuses on the way internal product development activities are coordinated with development activities of a supplier. Wynstra et al. [110] stretch that

activities that are carried out on this management level are always temporary activities that aim to develop a specific product.

2. The activity ”Suppliers” focuses at joint-development activities which focus on gaining a long-term, innovation based, competitive advantage through integrating the innovation potential of suppliers. Activities on this level are performed in parallel to those on the project level as well as in-between different project assignment and include tasks like ”the maintenance of a preferred supplier base and market research”[110, pp. 72]

3. The activity ”Technologies” focuses on the ”division of work between the manufacturer and its suppliers in the development and improvement of specific technological knowledge and skills”[110, pp. 73]. This includes the make-or-buy decision (compare 2.1.1 on page 6). As this level of management is of high strategic importance to a company as it can affect its long-term strategic options, there is usually a relatively high level of senior management involvement.

Wynstra et al. [110] identify five levels of responsibility that determine the kind of responsibility and involvement of purchasing managers in product development processes.

1. Specifications responsibility means that purchasing managers are involved in the actual design process with regards to anything related to materials, components or assemblies produced by suppliers by assisting the engineers on issues that ”should be taken into account from a purchasing perspective (e.g., technology availability, new technological developments in supplier markets, capacity constraints, lead time and cost consequences)”[110, pp. 76]. The involvement at this level can be further distinguished between activities that limit the number of possible alternatives (”restricting”) and activities that extend the number of alternatives (”extending”).

2. Operations responsibility refers to the coordination of supplier involvement and finding the right timing.

3. Structural responsibility describes the responsibility for development and management of a number of suppliers that are preferably used for conducting development projects. Unlike the first three level of responsibility, structural responsibility must be seen independently of temporary product development projects and is therefore of a higher strategic importance.

4. Preparations responsibility focuses on the efforts necessary for preparing and starting a project that involves supplier activities.

5. Policy responsibility includes all actions that aim to determine and define the role of different internal stakeholders in the product development process through formalized policies. The fifth level of responsibility aims to build a foundation whereon the other four levels of responsibility can be based on and is therefore of high strategic importance.

2.1.8 Supply Chain Risk Management

As supply chains and procurement markets get increasingly globalized it gets more and more important to manage and control the risks involved in these operations. Events such as disruptions, bankruptcies, breakdowns, macroeconomic and political changes make it necessary for the procurement and supply chain function to carry out adequate measures to manage and control these risks[71]. While reacting to those risks traditionally meant ”buffering against uncertainties, which sub-optimized operational performance”[39, pp. 698] modern risk management approaches try to incorporate risk mitigation measures in a way that minimizes negative impacts on operational performance.

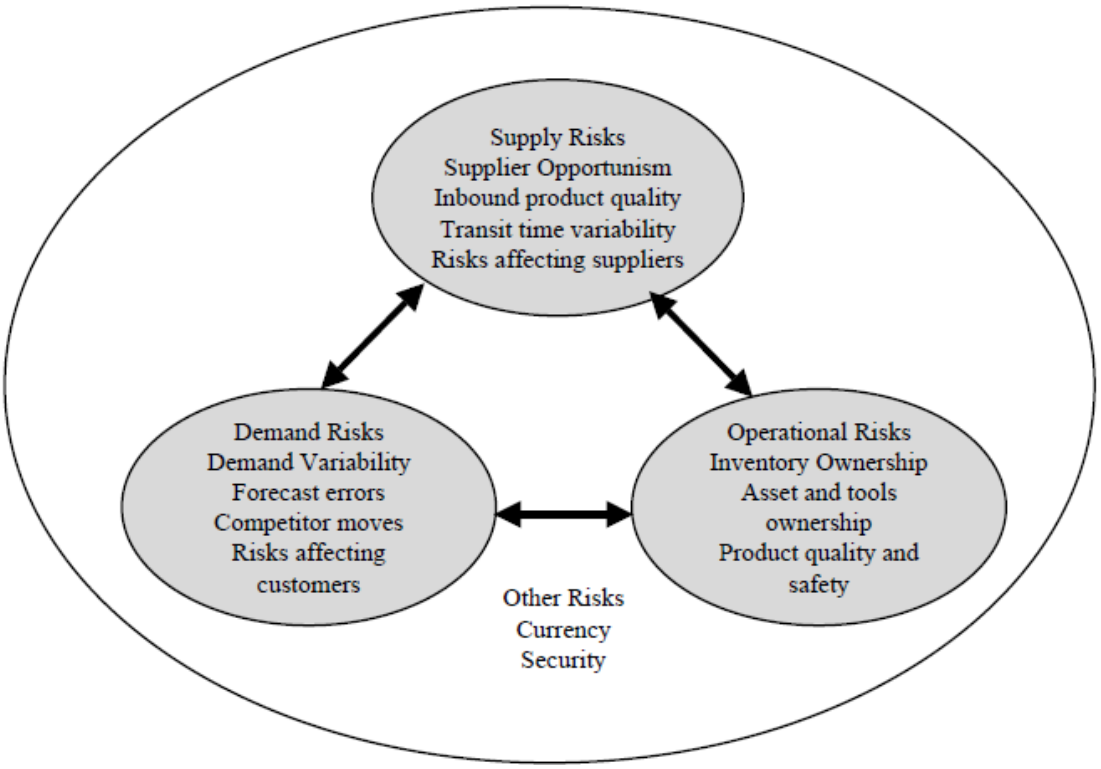

Figure 2.9: A framework for conducting supply chain risk management[71, pp. 201]

Manuj and Mentzer [71] develop a framework that distinguishes three categories of risks (compare 2.9), and tries to analyse risk factors based on whether they are internal, supply side based or demand side based. Zsidisin et al. [111] present a framework for assessing thirteen different supply risk categories. These thirteen categories can be merged in seven groups representing the following types of risk: Additional cost for cancellation or transportation due to a lack of sufficient planning, additional cost for material obsolescence, material price increase due to allocation, yield problems or changes of specifications, missing parts due to late delivery,

supply quality issues or instability in the supplier's country, additional cost due to single sourcing at ramp-up phase, additional cost due to contractual or currency issues, additional cost due to supplier development measures

In order to assess the risk in each category in a structured way, Zsidisin et al. [111] suggest to use a ten step approach that mainly takes into account the possible EBIT impact and the probability of occurrence before risk management measures in the current and following fiscal year. As an alternative approach Zsidisin et al. [111] suggest to focus less on the different categories of risk and more on factors critical for the proper supply of commodities. These factors include the following:

1. Design: This factors relate to the ability of the supplier to to complete and validate the design, assess it with regards to material interactions and manufacture the item.
2. Cost: Determining the cost risk includes assessing "target costs from the customer, industry benchmarking, should-cost models, and make-or-buy decisions".[111, pp. 405]
3. Legal aspects: Legal aspects include the legal status of materials or services, tax issues and import / export regulations. Furthermore, this factor includes risks associated with legally enforceable restrictions or commitments with regards to the use of specific materials or services.
4. Availability: The risk that suppliers are not capable of delivering the required quantity of materials or services at the required moment.
5. Manufacturability: "Risk associated with manufacturing's ability to produce when material specifications are met. If the material has not yet been received, this may entail anticipating potential future problems, such as materials that meet specialisations but do not meet design for manufacturing goals".[111, pp. 405]
6. Quality: The ability of the supplier to produce materials or services that continuously and consistently meet the required quality.
7. Supply base: This point relates to the necessity to select suppliers of sound financial background. Furthermore, this factor includes the need of suppliers to be based in politically stable regions.
8. Environmental, health and safety impacts: This factor relates to issues associated with the handling and use of potentially dangerous substances.

2.2 Organizational Design

As the purchasing function has been growing, different companies have introduced different kinds of purchasing structures to fit their respective needs. Over the years, scholars have done research on different drivers of change for organizational aspects of the purchasing function and have covered topics like centralization-decentralization in purchasing organizations, the location

of authority or the influence of different purchasing strategies on organizational issues[94]. Furthermore, the buying center as a cross-functional decision unit has been subject to considerable research-activities in the past.

2.2.1 Centralization and decentralization of purchasing organisations

In order to make best use of economies of scale and reduce process and transaction costs, companies are trying to implement centralized purchasing organization that use the same processes in all parts of the purchasing organization. Bundling demand, standardizing products and agreeing on framework agreements that have to be implemented corporatewide are the preferred methods to make best use of economies of scale and increase buying power.
Dimitri et al. [30] recognize three categories how procurement organizations can be set up in terms of centralization:

1. Fully centralized procurement organizations
   Fully centralized organizations conduct all purchasing related activities fully centrally. The question what to buy, when and where to buy are all conducted by a central unit that is dedicated to buy for the whole organization. Moreover, contract conditions are the same for all parts of the organization.

2. Fully decentralized procurement organisations
   Decentralized units have the authority and power to conduct procurement activities independently from the mother company or any centralized procurement unit. There is no requirement for the involvement of centralized units for making procurement related decisions, no matter whether they are of strategic or operational nature.

3. Hybrid procurement organizations
   Hybrid organizations incorporate characteristics of both, centralized and decentralized purchasing organization. Most commonly, centralized units will be involved in strategic questions while decentralized units will have the power to conduct operational activities independently[56].

Dimitri et al. [30] identify eleven factors of influence that determine whether the use of a more centralized or a more decentralized structure for procurement activities is most efficient. Many of these factors can not be seen independently of others as there are many interlinks. However, it is helpful to review them separately:

1. Cost efficiency
   For any private or public enterprise, cost control and efficiency is a central driver to achieve long-term financial success. Especially in manufacturing, the total spend as a percentage of revenues can be more than 70% meaning that procurement or more generally supply chain management is the most important lever for saving costs. Therefore, efficiently organising the procurement and supply chain function can be seen as an necessary requirement for being successful.

Dimitri et al. [30] identify three factors of influence that contribute to centralized procurement activities potentially being more efficient than decentralized:

- Synergies
  Synergies can be exploited wherever different organizational units source the same commodities. Thus, the synergy potential rises with increasing degree of standardization.
- Specialization
  A higher level of centralization allows procurement professional to focus their attention on a narrower set of tasks thus helping them to get a better understanding of the respective task. As learning effects are occurring, procurement professionals develop specialized skills that allow them to carry out their tasks in a more sophisticated and efficient way.
- Shared knowledge and resources
  Centralized organisations help enhance the sharing of knowledge and resources as they allow procurement professionals to use common solutions for different problems and facilitate the use of best-practice methods through the various procurement units.

2. Product standardization
   The more standardized a product is the more favourable will a centralized procurement organization be. In many cases the different products a company has to buy have a different level of standardization thus requiring different levels of centralization.
   As a high level of standardization means a low level of product heterogeneity, a low need of adoption to geographically different areas and a low risk of information processing errors it naturally favours central procurement.
   Furthermore, a high level of standardization means that high volumes of one commodity are sourced hence helping the supplier to make use of economies of scale and giving the buying organization leverage to impose substantial discounts.
   However, it has to be recognized that some commodities, though standardized do offer little advantages for central procurement due to geographical or legal reasons or due to logistic restrictions. Such commodities include energy, particularly electricity, water and most other commodities that are difficult or expensive to move. Therefore, even if centralized, such commodities will not offer many synergies.

3. Favouritism
   Some commodities offer no advantage when bought centrally since they ”incorporate local specialities”[30, pp. 59] that makes it in many cases hard or even impossible for centralized organizations to collect the information to efficiently carry out the required tasks. Such commodities might for example include cleaning services or facility management services.
   However, the principle to select those suppliers that provide the best value for money

might not be implemented by local units in some cases as they tend to prefer local suppliers due to historical or personal reasons and due to their stronger exposure to lobbying by local suppliers.

This does not mean that centralized units are immune to the occurrence of favouritism, however, the usually more formalized processes and a higher level of visibility considerably complicates committing activities of a questionable nature with regards to legal and compliance aspects.

4. Strategic procurement
   In order to decide which commodities should be purchased centrally, strategic importance can be an important indicator. Dimitri et al. [30] somewhat vaguely describe commodities strategic that are of considerable importance for the business. As indicated in 2.1.1 on page 7, factors that determine the strategic importance of a commodity are many and various. Therefore, as indicated in 2.1.3 on page 14 it seems appropriate to use the definition of strategic commodities Kraljic [59] has developed in order to systematically categorize all commodities.
   The more strategic a commodity is perceived to be, the more centralized the decision-making process tends to be.

5. Network effects and standards
   Networks as defined by Dimitri et al. [30] include physical networks like transport-networks or airline-networks as wells as telecommunication-networks, the internet, hardware- and software-networks and banks.
   The advantage of being part of such a network tends to increase with the amount of total members of the networks. Large networks are generally more attractive to join than small networks thus making centralized procurement an important driver of network-building activities.

6. Market dynamics
   Whenever markets change very quickly, decentralized procurement organisations seem to be capable of adapting faster to to the new environment. As more localized and decentralized procurement organisations are often closer to innovative market niches they are often capable of incorporating new technologies quickly without causing high costs of information gathering.
   However, more centralized procurement units often have more sophisticated know-how of the total market as they tend to have better trained and more experienced personnel. Market dynamics that go beyond local or regional developments are therefore preferably subject of research of more centralized units.
   Therefore, as there are good reasons for incorporating both, decentralized units that are flexible and can react quickly to changes on a local level and central units that are capable of seeing the market as a whole, a hybrid organisation seems to be very advantageous in terms of facing market dynamics. Especially in public procurement organizations, framework agreements are the tool of choice for promoting a hybrid procurement organization.

7. Emergencies
   Dimitri et al. [30] define an emergency in this context as an event that ”does not allow time to solicit and organize a competitive tendering”[30, pp. 66]. Such events can include but are not limited to natural disasters, safety or security issues.
   Neither form of organisational structure seems to have significant advantages over the other in case of an emergency. However, the type emergency might be of importance as emergencies on the local level tend favour decentralized organisations whereas emergencies that effect the organisation as a whole will require a more sophisticated approach that involves coordination of various stakeholders and therefore favours centralized organisations. Furthermore, as the competencies to deal with such disasters often require rigorous training and are very expensive to acquire, specialized units that are centralized but can be deployed to de-central units seem to be the measure of choice to deal with such events.
   However, it has to be considered that such a sophisticated approach towards risk management requires the investment of substantial funds and will therefore only be suitable to big organisations that have the required resources.

8. Decision information cost
   Decentralized units are typically required to provide information about local circumstances and customer needs a centralized unit can normally not acquire. Therefore, centralizing the decision-making process, whether in procurement or anywhere else, usually implies information processing and gathering costs.
   However, as innovations in information and communication technologies have facilitated communication processes and considerably lowered communications costs the need to decentralize decision making due to transactions costs has been decreasing.
   E-procurement, automated work-flow management systems and electronic communication have lowered information transaction costs, however, these systems facilitate monitoring costs as well. Therefore, the trade-off between decreased information transaction costs which favour a higher degree of centralization and lower monitoring costs which favour a higher level of decentralization has to be solved.
   Furthermore, it has to be considered that the information transaction cost will correlate positively with increasing size, fragmentation and complexity of the organization. Moreover, the nature of the commodity and and the sourcing market is of importance as well: Quite naturally, transferring information on standardized commodities or commodities that feature a low level of technological complexity is easier than doing so for a complex commodity. Quite similarly, operating and transferring information in a simple, steady market is easier than doing so in a complex, fragmented market that features a high level of uncertainty.

9. Bargaining power
   As bargaining power usually depends on the volumes involved, decentralized units that buy similar or identical commodities in different markets and with different suppliers obviously undermine the possible bargaining power of the organisation. Therefore, bundling strategies can help to increase the volumes thus increasing the bargaining power as well.
   Schuh et al. [96] have identified the combination of supply power of the supplier and de-

mand power of the buyer as the major driver of bargaining power. Therefore, making efficient use of economies of scale seems to be the most important lever of increasing bargaining power.
Moreover, it has to be considered that large organizations that use to buy large volumes of a specific commodity tend to favour large suppliers thus excluding smaller suppliers from the bidding process and undermining their own bargaining power as a lower number of suppliers in the bidding process means less competition and thus decreased buying power. However, there might be situations where bundling volumes is a necessary requirement for attracting large suppliers that are not willing to supply small amounts of a specific quantity.
Furthermore, in many cases suppliers provide a buyer with more than one commodity and bargaining power for different commodities might be different. Therefore, one commodities bargaining power can be used as a leverage for the another one.
To summarize the above mentioned arguments, it can be reasoned that bargaining power is very complex to determine and supply and demand power are the most important drivers of bargaining power.

10. Monitoring contractor's performance
    Continuously monitoring the performance of suppliers with regards to quality, delivery time and service is one of the most important tasks of the purchasing function.
    As centralized purchasing unit usually increase the involved volumes it gets easier for the buyer to "deter post-contractual opportunism"[30, pp. 73]. Furthermore, larger volumes facilitate increasing the efficiency of operations for the supplier.
    However, as centralization increases, the monitoring costs increase as well as the required information has to be collected from a wide range of different sources.

11. E-procurement
    The importance of information and communication technology (ICT) for facilitating communication processes has already been indicated. However, the benefits of advanced IT tools like e-procurement platforms or automated auctioning platforms go far beyond increasing communication effectiveness.
    E-procurement tools help increase operational effectiveness by automating tasks that have required human labour before the introduction of these systems and facilitate decision-making processes through providing information that was not available before.
    While Dimitri et al. [30] stretch that the introduction of e-procurement practices and a high level of centralization are closely linked as e-procurement tends to reduce information gathering cost, they also acknowledge that the benefits of e-procurement will be larger for those organisations that have not been centralized in the past while benefits will be smaller for organisations that are already highly centralized.

2.2.2 Shared services in procurement

Shared service providers aim to conduct activities that are required in different departments or units in a standardized way by pooling these activities. Subsequently, those activities are

implemented company-wide by a designated unit or person, the shared service provider. In order to successfully implement the shared service provider concept, it is a necessary requirement to set up standardized processes that satisfy the needs of all relevant internal customers and enable the company to fully make use of economies of scale. These initiatives result in ”new, semi-autonomous, service- and market-oriented organisational units, which have an own management structure and success responsibility”[79, pp. 348].
Neumann et al. [79] identified four main dimensions of shared service centres:

- Specialization and standardization: Shared service providers aim to efficiently make use of economies of scale, aim to increase the level of standardization and increase the quality of support processes.
- Transparency: Increased transparency as a result of shared services helps simplify controlling activities and enables companies to improve their business processes.
- Strategic focus: Internal customers of the shared services have a natural interest in the shared services being aligned with their own strategic focus. Furthermore, bundling of similar activities offers the chance to exploit possible synergies.
- Customer focus: Customer satisfaction is increased by guaranteeing service level agreements. The services are provided to internal as well as external customers and the shared service provider has to compete with external service providers as well in order to make sure, the customer gets the required quality for the best price.

Furthermore, Neumann et al. [79] develop three main implications of the use of shared service centres:

- Strategy realization: Shared service centres that specialize in one specific area are capable of reacting quicker and more flexible to changes in environment thus enabling companies to implement corporate strategy in an uncertain environment.
- Organizational change: Shard service centres reduce the level of redundancy and organizational slack through bundling core competencies in central units.
- Knowledge transfer: As a shared service provider focuses on a specific core competence, the center is capable of concentrating know-how and enhancing standard procedures through the use of best-practices and the efficient implementation of lessons learned.

As procurement activities have the potential to ”standardize products, optimize processes, bundle and select supplier through strategic aspects and a specific it-supported demand management”[79, pp. 349], shared service centres for procurement activities are implemented quite commonly.

The lead-buyer model is the most widely used method for integrating shared service centres concepts for procurement activities. The lead-buyer concept is a way of implementing a shared service approach in purchasing through the use of centrally controlled buyers that can be deployed de-centrally and focus on a specific commodity.

The lead-buyer concept aims at creating benefits through bundling commodity demand thus making use of economies of scales. Bundling purchasing volumes not only increases the demand power of the buyer but also aims to reduce transaction costs. The lead-buyer should be part of the corporate unit that has the biggest buying share of the respective commodity as this unit has usually the deepest and most detailed know-how of the commodity.[92]
While the strategic aspects of the commodity such as negotiating the framework agreements are handled centrally by the lead-buyer, the operative buying can be done de-centrally by local buyers in the respective units.

2.2.3 Buying Center

While consumer buying decisions and organizational buying decisions are both the outcome of a human decision-making process, organizational buying usually involves multiple persons and is rarely the outcome of the decision of only one person. Due to the often technologically advanced nature of the purchased products and the high financial volumes involved, the industrial buying process frequently takes a long time and involves professionals from multiple disciplines and functions [66]. The multi-person, multi-functional nature of the buying process leads to the term ”buying center” [107]. The buying center can be described as an ”informal, cross-sectional decision-unit in which the primary objective is the acquisition, importation and processing of relevant purchasing-related information” [99, [pp. 56]. Spekman and Stern [99] describe the buying center as an ”informal communication network which does not derive its structural configuration from the formal organization per se, but rather from the regularized patterning of interpersonal communication flows”[99, [pp. 56]. Therefore, the buying center includes every person that is involved in the buying process in any way, whether it is formal via written buying processes and procedures or via informal ways of communication and participation. Decision-making processes in the buying center are restricted by environmental and organizational constraints. Environmental constraints include physical, technological, economic, political, legal and cultural factors.[107] Organizational factors ”cause individual decision makers to act differently than they would if they were functioning alone or in a different organization”.[107, pp. 14]

In order to evaluate possible factors of influence on the size and structure of the buying center, the industrial buying and decision making process has to be split-up into a number of sequential steps in order to verify the influence of various stakeholders on the specific decision making tasks(compare Dadzie et al. [26], Lilien and Wong [66]).
Lilien and Wong [66] suggest to use a 7 step model:

Figure 2.10: Decision making process according to Lilien and Wong [66]

Dadzie et al. [26] prefer a model involving the following 6 decision tasks:

Figure 2.11: Decision making process according to Dadzie et al. [26]

Although these processes are not identical, they generally show a similar and consistent pattern of action: In the first phases, the type of product and its specifications are determined (Initial, Determine type and Draw up specifications in Lilien's model and Need recognition and Establishement of specifications in Dadzie's model), in the second phase the suppliers are evaluated and selected (Evaluate source and Select supplier in Lilien's model and Budget approval and Supplier search in Dadzie's model) and in the third phase these decisions have to be verified and evaluated (Determine amount and Final approval in Lilien's model and Supplier search in Dadzie's model).

Johnston and Bonoma [53] argue that the buying center can exist as an informal "communication network that does not derive its configuration nor operation from the formal organization but rather from the regularized patterns of communication"[53, pp. 146]. Therefore, in order to assess the drivers behind the structure and size of the buying center , Johnston and Bonoma [53] determine five dimensions of the buying center:

- Vertical involvement determines the number of hierarchical levels that are involved in the buying process. Vertical involvement tends to be affected positively by an increase in complexity, novelty and importance of the purchase.
- Lateral involvement specifies the number of different functional groups involved in the decision making. Lateral involvement in the buying process decreases with increasing formalization while it increases with increasing importance and novelty of a purchase.
- Extensivity specifies the total number of participants in the buying process. Extensivity is positively correlated with the level of formalization of the organization. Furthermore, the purchase of capital goods tends to cause larger buying centers. Moreover, the complexity and importance of the purchase is positively correlated with the buying center size as well.
- Connectedness specifies the level of interconnections via directed communication between the members of the buying center and centrality that is specified in terms of the purchasing manager's "communication power". Connectedness is strongly affected by the level of formalization and centralization. The more centralized the organization is, the higher is the level of connectedness of the purchasing manager.
- Centrality refers to the total number of sent and received communication of the buying manager.

Crow and Lindquist [25] present empirical evidence that formal level of education is positively correlated with the total number of persons involved in the industrial buying process.

However, this correlation can at least partially be attributed to the fact that highly educated purchasing professionals tend to manage more complex commodities. As Johnston and Bonoma [53] showed, complexity is a major driver behind vertical as well as lateral participation in the buying center. Furthermore, [25] indicate that the higher level of participation in buying processes managed by professionals with a high level of education might be due to them being wise enough to understand that a larger number of participating persons could be beneficial for the whole process. The high level of participation in processes managed by professionals with relatively low formal education can be partially explained by a probable lack of skill and confidence. Quite interestingly, the research of Crow and Lindquist [25] also indicates that the level of participation in the buying processes managed by professionals of medium-level formal education is lower than in those managed by professionals of the highest or lowest formal education. Crow and Lindquist [25] hypothesise that this can be attributed to what they call "sophomoric influence"[25, pp. 53] - the fact that these professionals might be smart enough to understand parts of the process but not wise enough to value the positive influence of increased participation in the process.
The perceived influence of purchasing professionals on the buying process is affected by the educational backgrounds of purchasing professionals similarly to the way the size of the buying center is affected. Highly educated professionals - just as those with the lowest level of education - perceive to have less influence on the buying process than those with an average level of formal education. Furthermore, the perceived influence of those involved tends to decline with an increase in the complexity of the process.
Furthermore, the research of Crow and Lindquist [25] shows that the size of the buying center is positively correlated with the size of the entire firm. This correlation can at least partially be attributed to a higher degree of specialization in bigger firms that causes an increase in buying center size. Moreover, the function of the firm influences the buying center size as well. Governmental, non-profit and educational organizations tend to have larger sized buying centers. First-time buying decisions tend to involve a larger number of persons than re-buys.
Crow and Lindquist [25] conclude that the characteristics of the firm are of higher importance than those of the single individual. Moreover, the complexity of the buying decision tends to correlated with the maturity of the process. Thus, a first-time-buy is more complex causing the buying center to be of a larger size. Furthermore, as can be expected the perceived influence of the buyers decreases with increasing size of the buying center.

Dadzie et al. [26] examined the structure of the buying center for the sourcing of logistics automation systems. The authors identified the rate of adoption of the technology, the degree of participation and the coalescence on buying decision criteria as major factors of influence. Based on these characteristics they empirically verified the influence of various functional groups. Based on their research, they identified nine functional areas to be of relevance: senior management, logistics, manufacturing, engineering, purchasing, Research and Development, finance, marketing, others. Subsequently, the participation of these functional groups in each level of the decision making process was examined. Eventually, the functional groups were categorized based on their level of participation in the various stages of the decision making process. Their research shows that influence of finance, marketing, research and development and others

is negligible for almost all steps of the process (except for budget approval were finance has considerable influence).
The results of the buying center research done by Dadzie et al. [26] are consistent with the results of of the research of Lilien and Wong [66] that shows that engineering is the dominating function in the first three stages of the buying process with the purchasing and the production being the second most relevant. The next two stages are dominated by the purchasing function and the last two stages by the senior management.
Garrido-Samaniego and Gutiérrez-Cillán [37] suggest three groups of causal determinants of participation and influence in the buying process:

- The conditions of the purchase (novelty, complexity, importance, risks, time pressure)
- The personal characteristics of the individuals involved (personal stake, personal experience)
- The structural characteristics of the organization (specialization, standardization, centralization, formalization, configuration, size, participation and influence)

The research of Garrido-Samaniego and Gutiérrez-Cillán [37] demonstrates that while the level of influence and participation of the engineering function is eminent in the whole purchasing process it is especially important in the earlier stages of the process. The manufacturing/production function showed the highest level of participation in the earlier stages as well. Senior management was more involved in the later stages due to the high costs of capital equipment and the involved financial risks. Purchasing was involved primarily in the later stages (supplier search, vendor evaluation, supplier selection).

2.2.4 Compliance: Maverick buying

The term maverick buying means non-compliant buying behaviour and includes a wide range of activities ranging from non-intentional maverick buying to systematic sabotage of buying policies[55]. Similarly to Karjalainen and van Raaij [55], Cox et al. [24] define maverick buying as buying outside of contracts that have been agreed on. A bit more general, Lonsdale and Watson [69] define maverick buying as the share of the purchasing spend that is done without consideration of internal policies.

As companies increasingly try to reduce cost by means of exploiting synergies and material bundling, many companies define company-wide framework agreements that enable central purchasing organisations to use the laws of economics of scale. Reducing the supplier base, increasing the purchasing leverage through increased purchasing volumes and reducing purchasing process costs all contribute to higher return on supply management assets and make purchasing an important source of competitive advantage.[55]
However, the potential savings associated with these initiatives can only be achieved if all purchases are ”channelled through these contracts to the preferred suppliers with pre-specified terms”[55, pp. 246]. As the authority to order materials or services is in many companies

decentralized, it is necessary to raise awareness for using these pre-defined contracts.

Based on a literature reviews, Karjalainen and van Raaij [55] identify five different categories of maverick buying:

1. Unintentional maverick buying is caused by employees not being aware that there are policies in place that regulate the way corporate buying is conducted. Therefore, unintentional maverick buying is partly caused by the employer itself as there is a lack of information. Unintentional maverick buying does not aim to harm an organisation and can therefore not be classified as deviant.

2. Forced maverick buying is caused by employees experiencing barriers to comply with corporate buying policies. Employees are informed about buying policies and know that their actions do not comply with these policies, however, they see no way of solving an issue that does comply with regulations. In many cases a lack of training and support causes forced maverick buying.

3. Casual maverick buying occurs when employees are aware of corporate buying policies but choose not to comply with them. Casual maverick buying does not aim at harming the company but results of an employee feeling no need to change established procedures. In many cases, casual maverick buying results of a lack of management guidance, a lack of organisational incentives for complying with corporate policies or an employee not seeing the benefits of the buying policies.

4. Well-intentioned maverick buying includes non-compliant buying actions that aim at creating benefits for the company. Well-intentioned maverick buying occurs when employees think it is in the best interest of a company not to comply with its own purchasing policies. Well-intentioned maverick buying can be caused by employees feeling they have superior purchasing skills then those who created the policies or by the employees not being aware of the benefits of total cost of ownership approaches.

5. Ill-intentioned maverick buying buying means employees are well aware of the existence of corporate buying policies but choose not to comply with them due to opportunism or resistance to change. Reasons for ill-intentioned maverick buying include feelings of injustice, feelings that personal decisions are being restricted by buying policies or a feeling of insufficient involvement in the creation of buying policies.

The reasons for the occurrence of maverick buying include internal as well as external factors. Factors that increase the probability of non-compliant buying behaviour in the form of maverick buying include the following:

1. In order to sustain relationships with existing suppliers, employees try to resist switching to a new, preferred supplier thus non-complying with corporate buying policies. Motivation to do so includes the wish to sustain a relationship with local suppliers, familiarity and unwillingness to change [55, 63].

2. In case there is not yet a negotiated contract with a supplier, employees still tend to buy.

3. The users buying material might in some cases disagree with the quality or suitability of purchasing materials delivered by a preferred supplier and therefore try to make use of other suppliers.

4. In case a new item is needed that has not yet been sourced by the purchasing function, employees tend to source it themselves in order to get it as quick as possible.

5. A lack of information of buying policies.

6. Internal disputes between the purchasing function and the departments that make use of the material.

7. Buyers perceive the buying policies to be ineffective and bureaucratic.

The consequences of maverick buying are many and various and include direct financial effects as well as indirect effects. Generally, consequences of maverick buying can be split in two classes: higher purchasing costs and decreasing economics of scale.

1. The purchase price of the items in question will usually be higher as smaller units usually buy smaller amounts and therefore get smaller discounts.

2. The processing and transaction costs of a purchase has to be considered as well: the more fragmented the supplier base gets, the higher will be the transaction costs of the purchase[24]. Furthermore, maverick buying usually causes increased processing costs and additional paperwork[55].

3. Maverick buying can lead to a firm not meeting promised volumes with suppliers causing suppliers not give the promised discounts and loosing interest in a the buying firm.[55]

4. Maverick buying can cause additional legal risks as more contracts being signed means that terms and conditions might not be reviewed with the required rigour.

Commodities regularly associated with maverick buying include indirect materials (materials that are not directly part of the end-product), notably commodities used for maintenance, repair and overhaul operations. Furthermore, office supplies and travel expenses seem to be commodities associated with an increased level of maverick buying[55].

2.3 Purchasing Professionals

With the evolution of the purchasing function from a clerical to a strategic function [23], also the type of professionals required for the purchasing tasks changed. Foerstl et al. [35] empirically found that talent management directly influences the purchasing performance of an organization, therefore, the skill set of employees receives raising attention.

2.3.1 Skillset

The skills necessary for procurement professionals are determined by the nature of their work. Therefore, a change in the role of the procurement function entails a change in the necessary skill set of the professionals performing the required tasks.
A very common framework for structuring the necessary skills is the so called "Genfer Schema" that was developed at a conference in Geneva in 1950 in order to assesses the requirements for professionals via a two dimensional matrix. Featuring the stress professionals are exposed to and the skills necessary to perform a specific task on one axis and the necessary mental demands, physical demands, responsibility and working conditions on the other axis, it offers a way to efficiently categorize the kind of work that has to be performed in one of six categories.
As stated above, the change of the procurement function quite obviously causes a change in the categorization of the skill set of procurement professionals. This change can be assessed and categorized by applying the "Genfer Schema".[36]

Additionally, it is also possible to categorize the nature of the problem a certain role has to solve in order to get an understanding for the necessary skills, that role requires. Humphreys et al. [49] suggest to apply the Professional Service Firm (PSF) model developed by Maister [70] in order categorize the activities occurring in procurement in 3 groups

Brains: Problems are likely to be extremely complex, innovative. Brains require highly creative people and command the highest prices.

Grey hair: These activities require a customized solution that is based on experience of similar problems, but are less innovative and require less creativity.

Procedure: Procedures are programmable problems that can be covered with standard solutions.

With these possible categorization types, the available literature can be revised. One of the pre-strategic area of purchasing was conducted by Kolchin and Giunipero [58] in 1993. Their goal was to determine the skill set of a perfect purchasing professional. The study contains questionnaire-data collected from 123 companies in the US. The result were 24 skills, grouped in four categories listed with their absolute ranking:

Technical skills: decision-making ability (1), negotiation (2), analytical skills (7), computer literacy (19), computational skills (21), technical skills (22), process development skills (24).

Managerial skills: customer focus (8), mastering of change (10), planning (12), management of internal relations (13), understanding business (16).

Interpersonal skills: problem solving (4), communication (3), persuasiveness (5), conflict resolution (6), leadership (9).

Individual skills: tactfulness (10), being organized (14), creativity (15), inquisitive nature (17), writing abilities (18), salesmanship (19), risk taking (23).

Giunipero and Pearcy [40] conducted the first survey with a focus on strategic skills in purchasing. For the study 136 UK purchasing professionals were asked for important skills in the purchasing function and they identified 29 skills in seven categories to be essential for purchasing professionals. The seven categories are: Strategic Skills, Process Management Skills, Team Skills, Decision Making Skills, Behavioural Skills, Negotiation Skills and Quantitative Skills. The following list contains the individual skills of each group with their ranking on a 1-5 scale, 5 being most important.

Strategic Skills: Strategic thinking (4.47), supply base research (4.01), structuring supplier relationships (4.33), technology planning (3.42), supplier cost targeting (3.93)

Process Management Skills: Organization/time management (4.12), tactfulness in dealing with others (4.10), written communication (4.02), problem solving (4.46), conflict resolution (4.44)

Team Skills: Teamwork (4.59), leadership (4.32), managing change (4.54), managing internal customers (4.27), salesmanship (3.84)

Decision-making Skills: Computer literacy (4.31), ability to make decisions (4.73)

Behavioural Skills: Interpersonal communication (4.81), risk taking/entrepreneurship (3.99), creativity (4.13), inquisitiveness (4.03)

Negotiation Skills: Negotiation (4.55), customer focus (4.52), influencing and persuasion (4.52), understanding business conditions (4.47)

Quantitative Skills: Computational (3.80), technical (3.54), blueprint reading (2.50), specification development (2.86)

Giunipero and Pearcy [40] find that the importance of strategic skills improved. However, the change of the function from a clerical to a strategic function also entails other required skills like team skill. They argue that this is due to the change of tasks. While earlier purchasing professionals only had to execute given tasks, now they have to participate in corporate decision making and, therefore, must possess team skills.
The most important skills, however, where not subject to immense change. Giunipero and Pearcy [40] find that the participants "rated the five most important skills as: (1) interpersonal communications, (2) ability to make decisions, (3) ability to work in teams, (4) negotiations, and (5) customer focus. These skills are reflective of the dynamic, interactive nature of the purchasing function and its role as a boundary spanner."[40, pp. 12] However, when comparing to the results of Kolchin and Giunipero [58] the most important skills do not vary severely.

A later study conducted by Giunipero et al. [41] in 2005 covers changing requirements as a result from a more volatile business environment. The study finds that a part of the skill set of a purchasing professional, the category of *flexibility skills*, is similar to that of an entrepreneur. The flexibility skills category consists of managing risk, making decisions, planning, interpersonal communication, influencing and persuasion and internal motivation. One can see, that the

skill set overlaps with the previous studies, however Giunipero et al. [41] argue that successful purchasing professionals possess more entrepreneurial thinking in more flexible supply chains.

Apart from flexibility the purchasing function also shifts towards more strategic orientation. Giunipero et al. [38] acquired data from 54 executives of larger US companies about future trends in purchasing. The more strategic orientation implies more focus on strategic planning (project scoping, goal-setting and execution) as well as better financial understanding of cost accounting and a well-founded business case. According to Giunipero et al. [38], purchasing also requires technical skills as web research or sourcing analysis. The study finally finds again communication and team skills to be as well important for future purchasing and supply chain professionals.

2.3.2 Training

With identifying the relevant skills in the purchasing function, the question of how to teach the skills arises. Giunipero and Handfield [42] conducted a survey in 2003, where the purchasing training, among other fields, was analyzed.

First, the organisation of training was analyzed. It was found that training is already highly centralized (41% centralized, 39% centralized/decentralized), and is predicted to become more centralized in 2010 (46% centralized, 50% centralized/decentralized). A training council, responsible for trainer selection, course contents, etc., is implemented in 32% of the companies, but is predicted to rise to 67% in 2010, therefore Giunipero and Handfield [42] find a more structured training approach. The person responsible for training was found to be at a managerial level and sometimes outside the purchasing function (e.g. human resources). 50% of the firms offer formal training programs and the value is predicted to raise to 93% in 2010. However, compared to the similar earlier study by Kolchin and Giunipero [58], the value for formal training in 2000 was predicted to be 77% already. Also the amount of firms, which formally evaluate training needs did not change from 1993 to 2003 and is at a level of 70%. The prediction for 2010 is that 95% of the companies will use a formal process to evaluate training needs, which is about the same as was predicted for 2000.

Second, the amount of training was investigated. The average number of days purchasing professionals spend on training per year is 8.61 and is predicted to raise to 10.31 in 2010. The costs for training are 2.5% of the purchasing budget in 2003 and 3.4% in 2010. Giunipero and Handfield [42] find that the importance of training in the view of the management is moderate, but rises in 2010. It is suggested, that there is a correlation with the rise of the importance of the purchasing function at all. The study further finds, that in 2003 69.3% of the purchasing personnel participated in training. The participation rate is predicted to increase to 87% in 2010.

Finally, the study asked for the training methods in use and the training providers in the purchasing function. The most highly rated three methods are “on the job/informal” used by 78%, “formal classroom” named by 72% and “self-paced e-learining” used by 57%. The rest of the methods are used by less than half of the responding companies. These top three methods were also the most frequently used methods. Giunipero and Handfield [42] also find that digital training methods will be more frequently used in 2010, although, informal training on the job and

formal class room training will remain important. In terms of training providers, the study finds, that 66% of the training is conducted by internal personal, either specialized training personal from the human resources department or by functional or divisional exports. And 34% of the trainings are provided by external sources, like associations or universities.

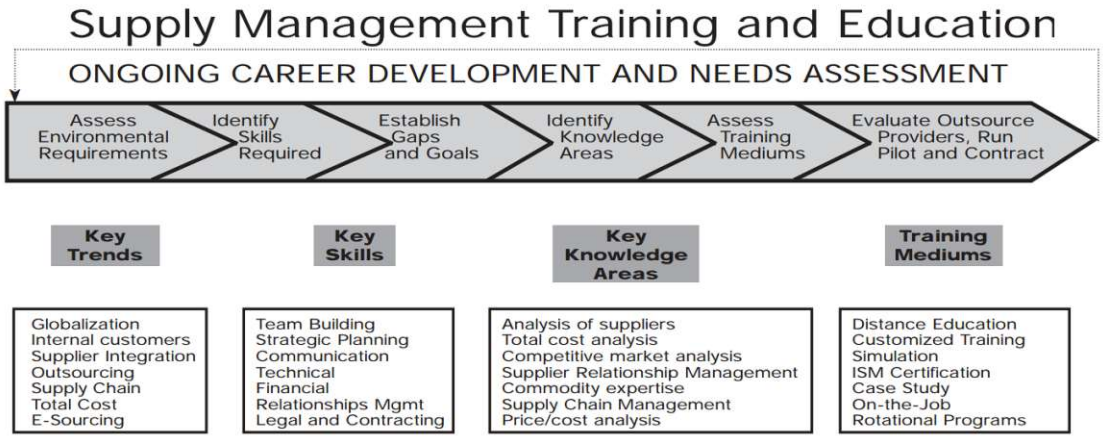

Figure 2.12: The Career Development and Needs Assessment Process[42, pp. 94]

Giunipero and Handfield [42] finally suggest a six-step approach to assess needs for development as described by figure 2.12. The first phase is assessing environmental changes like globalization or other trends in purchasing. In the second phase the skills required to cope with the changes have to be identified. Suggested frameworks are a Hoshin Plan or similar planning tools. Phase three consists of determining the gaps between the skills of the purchasing managers and the required skills. As fourth step the most important knowledge areas for improving competence, like supplier analysis, supplier relationship management or total cost analysis, are identified. As last but one step the training methods are evaluated and finally in the last step number six external training providers should be evaluated for training agreements. The authors suggest, that internal training groups can not be on the edge of latest finding and, therefore, more and more companies seek for external training providers.

2.4 Environmental influences

2.4.1 Globalisation

With regards to economical issues, globalisation can be described as a ”reduction in the barriers—whether technological or legislative-to economic exchanges between nations”[34, pp. 1]. Other scholars stretch that the term globalisation involves concepts like internationalisation, liberation, universalization and westernization.[95]

Since the barriers that have historically prevented private enterprises from expanding beyond national borders have been reduced continuously over the last decades, companies have increasingly taken advantage of differences between countries through relocating parts of their value chain oversees. Differences in labour cost have played a major role and have been the single most important driver of these developments.[34]

Moreover, Bogaschewsky [17] strongly emphasizes that the reasons for "going global" go far beyond differences in labour cost and include a wide variety of reasons such as possible tax benefits, differences in environmental standards, easier access to possible future sales markets or the need to satisfy ever more heterogeneous, diverse and demanding customer expectations.

As cost pressure has been steadily increasing over the last decades and new competitors have entered markets that have traditionally been dominated by companies from industrialized countries, companies have been seeking strategies to deal with these new challenges. Offshoring and offshore outsourcing have emerged as suitable strategies that enable companies to stay competitive.[52]

While offshoring describes the task of relocating processes, activities or whole business units of a company to a foreign country[102], it does neither specify whether these locations are to internal are external partner nor does it determine the geographical distance.[86]

There are three dimensions that can be used to describe the type of offshoring that is being conducted:

- Type of offshoring contractor: Internal or external offshoring
  While internal or captive offshoring describes the process of relocating firm-internally from one unit to another one that is located in a foreign country, external offshoring describes the process of outsourcing to a supplier that is located in another country[31]. Therefore, external offshoring, or offshore-outsourcing, can also be seen in the context of sourcing strategies, particularly in the context of global sourcing.
  In many cases, internal or captive offshoring is used in the context of technology transfer by means of moving products or processes to foreign subsidiaries in order support those units develop new skills.

- Geographical distance: Nearshoring or farshoring
  While the term nearshoring describes the process of moving processes to a country that is in relative geographical proximity to the location of origin, farshoring means to offshore overseas.
  While there is no clear borderline between what is near and what is far, it is generally accepted that nearshoring in Europe means offshoring to eastern Europe or at most middle east.

- Type of process that is offshored: Offshoring of physical tasks or services
  Offshoring of services has different requirements than offshoring of physical tasks.

Jahns et al. [50] introduce the use of offshore development centres that are set up by means of joint-ventures with local players as an additional dimension.

The motivation for global sourcing seems not to have changed dramatically over the years[76, 77, 78]. Advantages of global sourcing that companies consider particularly important include the following:

- Cost reduction: Reducing purchasing prices in order to stay competitive has historically been the most important driver of global sourcing and still is the most important factor.
- Availability and exposure to foreign technology and resources:
- Quality improvements: While possible improvements of product quality have been a major argument for global sourcing in the past, it seems to have decreased in importance recently.
- Enhancing the global attitude of the company: Some companies seem to see offshoring as a starting-point for an internationalization strategy. Offshoring can be a good choice for creating the international mindset that is necessary for implementing such a strategy.
- Possibility of developing a presence in a foreign market: Global sourcing offers the chance to build up a presence in a supplier market that might develop into a sales market.
- Global sourcing as a reaction to competitor's actions: In many cases, companies' decisions to implement global sourcing initiatives seem to be a result of competitors improving their performance through global sourcing.
- Global sourcing as a way to increase supplier competition: As global sourcing usually increases the amount of possible suppliers the bargaining power of companies tends to increase.

2.4.2 e-Procurement

Besides the already mentioned enivornmental influances on the purchasing function, the last presented trend within this literature review is the trend to automate operational tasks. This can be done via various systems, like ERP systems, supplier relation management systems, or e-procurement systems.

Presutti Jr [87] proposes an adapted framework for calculating the economic value added by adding reduction in costs (transaction costs, purchasing costs, etc.) and assets (inventury turns, cycle time reduction, etc.) and the increased revenue (new products, faster time to market, etc.). The framework gives to possibility to measure the impact of e-procurement and targets to vizualize the advantages of e-procurement. Another study by Quesada et al. [89] reveals a positive relation between the use of electronic procurement systems and the procurement practices, meaning for example more efficient information gathering or contract management. The authers further find support for a positive relation between e procurement usage and the procurement performance, meaning tansaction and communication performance. Fianlly, Davila et al. [28] find that e procurement enables companies to save 42% in transaction costs.

Therefore, it can be seen that electronic systems, wether for external or for interal communication, result in a transformation of the procurement process and, therefore, also in a transformation of the required professionals to fullfil the given tasks in the function.

CHAPTER 3

Method

A three step approach as indicated in figure 3.1 was applied in order to get meaningful results. A literature review was conducted in the first step in order to get familiar with the research question and prepare for the second step of the study. The second step was a series of interviews that were evaluated using qualitative content analysis methods and the third step consisted of an industry survey that was evaluated using statistical analysis tools.

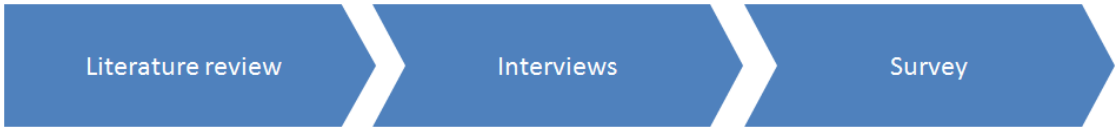

Figure 3.1: Structure of the study

Srnka and Koeszegi [101] developed a framework that helps to systematically design and analyze combined qualitative-quantitative studies. As suggested by Srnka and Koeszegi [101] there was a sequential approach with two separate studies used. At first the interviews were conducted that mainly focused at getting a better understanding of the core issues and at determining the most crucial questions with regards to the research question for subsequent empirical verification. Semi-structured interviews were used during this phase in order to cover a broad range of different issues while still being able to focus on the research question. Subsequently, based on the knowledge gained in the interviews a survey was designed and analyzed statistically.
The research question to be answered in this thesis was the future development of the procurement function with a focus on skills and education of purchasing personnel in Austria. As there was no comprehensive information available about this topic, it was quite clear from the beginning that the necessary data would have to be collected by doing interviews or conducting a survey.
There was a choice to be made between a qualitative, interview based study and a quantitative,

survey based study. As a quantitative based study requires considerable knowledge to efficiently design the survey, it was decided that the literature review alone would not be sufficient to prepare for the survey design. An interview based, qualitative approach could have been conducted with the literature review as a preparation, however, a qualitative study can never be representative as the number of interviews is limited. Therefore, it was decided to use a three step approach, consisting of a literature review, interviews and a survey as suggested by Srnka and Koeszegi [101]. As the relevant literature has already been reviewed in chapter 2 on page 3 there will be a focus on the later two stages in this chapter.

3.1 Interviews

The interviews focused on finding out the essential questions for the survey. As the goal of the interviews was less to get concrete results but more to get a broad picture, it was decided to choose an interview method that leaves the interview participants leeway to focus on what they themselves consider essential. Therefore the semi-structured interview and the narrative interview were considered as possible methods for this phase.

3.1.1 Narrative Interview

The narrative interview consists of three main phases, namely the initiation, the main narration and questioning phase.[43]
The initiation is used to explain the process of the narrative interview to the informant. Furthermore, the topic of the interview is introduced. The initiation is followed by the main narration, which is a speech of the interviewee. Within this phase, the interviewer must not interrupt the narration. Only non-verbal gestures to encourage the informant to continue story-telling can be given. Once the interviewee gives a clear sign, that the narration is over the questioning starts. However, this phase is used to clarify open topics of the narration by using open questions, which encourage the informant to tell a further story. The questioning phase is not intended to judge or argue about the topics brought up by the interviewee.
The initiation phase starts with asking the interviewee for the permission to record the interview, as the record is need to analyze the interview later on. Second, the research topic is introduced to the interviewee. Glinka [43] highlights the importance of explaining why especially the story of the person interviewed is necessary for the research.
The next step is to present the initial topic of the interview. Therefore, a visual aid can be used, which helps the interviewee to understand the topic. The explanation of the topic should conclude with an explicit request for the interviewee to start the narration. [54]
Jovchelovitch and Bauer [54] draw attention to some details when introducing the topic of the narration. First, the perspective of the narration topic should be open enough, in order to allow the informant to create a long story. Second, the interview must not introduce own thoughts or ideas about the topic as ideas are only supposed to come from the interviewee. Also any further information about the topic should be avoided, so the interviewee is not influenced in his nar-

ration. The interviewer should play the role of an uninformed listener. Finally, the informants own stake in the topic should not be addressed by the interviewer to avoid that the informant is defending or explaining his or her position within the narration.
The main narration consists only of the interviewee speaking about the research topic. The interviewer may only interfere by encouraging the interviewee via non verbal gestures like laughing or showing consternation via facial expression. Also, short statements that show active listing like ”yes” or ”I see” and are encouraging the informant. [43, 54]

3.1.2 Semi-structured Interviews

Dunn and Hay [32] distinguish between structured, semi-structured and unstructured interviews and state that ”structured interviews follow a predetermined and standardised list of questions. The questions are always asked in almost the same way and in the same order. At the other end of the continuum are unstructured forms of interviewing such as oral histories...The conversation in these interviews is actually directed by the information rather than by the set of questions. In the middle of this continuum are semi-structured interviews. This form of interviewing has some degree of predetermined order but still ensures flexibility in the way issues are addressed by the informant”[32, pp. 80].

Longhurst [68] define semi-structured interviews as a kind of interview where ”one person, the interviewer attempts to elicit information from another person by asking questions”[68, pp. 105]. Although semi-structured interviews follow a structure that is defined through the questions that have been defined by the interviewer, it is still possible for the interviewee to emphasize topics he or she considers particularly important. Semi-structured interviews are sometimes considered to be informal or conversational as they allow the interviewee quite a bit of leeway what to focus on. Semi-structured interviews are among the most common used interview methods in qualitative research and are suitable for collecting data about a broad range of topics.[68]
Semi-structured interviews are suitable to be used either independently of other methods or in an approach that involves multiple methods. The scope of semi-structured interviews goes beyond of what can be considered a chat[68] as they involve a considerable research effort that is necessary to develop the questions, to find possible interviewees and to convince them of participating in the study, it still has a conversational character.[68]

Longhurst [68] consider the following preparations essential for successfully conducting semi-structured interviews:

- Formulating questions:
  The first step for the interviewers is to get an understanding of the topic that allows them to effectively formulate questions. When formulating questions, the interviewers have to consider the relevance of the question with regards to answering the research question or getting insides for possible subsequent empirical research as well as the ability of a question to attract the interest of the interviewee and ”make him or her talking”.

- Select and recruit participants:
  The first step in the participant selection process is to define the target group that has the knowledge to comprehensively answer the prepared questions. Once, the target group is defined, there are multiple ways of finding participants. Possible approaches include contacting professional organisations, cold calls as well as personally approaching persons at fares or conferences. It must be considered that personally approaching possible interview candidates increases the possibility of successfully recruiting the person in question.

- Defining the interview location:
  In most cases it will only be possible to interview business people in their own offices. This can be both, an advantage as well as a disadvantage. While seeing the environment the interviewee is working in might give the interviewer additional information that might in another location not be available, it can also restrict interviewees from criticizing their own organisation.
  The main concern however should be to find a location that makes interviewees feel comfortable.

- Recording and transcribing discussions:
  It is possible to either take written notes or record the interview by using electronic recording devices. Recording the interview electronically offers the advantage that the interviewer can focus on the interviewee. Even if interviews are recorded it can still make sense to make additional notes describing non-verbal aspects of the interview that might be lost otherwise.
  It is advisable to transcribe interviews as soon as the interviews are finished as this makes transcribing easier.

- Ethical issues:
  Confidentiality and anonymity are two issues of utmost important that need to be addressed before the interview starts. Interviewees need to be assured of the confidentiality and anonymity in order to make sure interviewees are answering all questions without having to think about what would happen in case the interview was published. Furthermore, it can be helpful to offer participants to receive the outcome of the study as soon as the research is finished and documented.
  Another ethical issue that might arise, notable if controversial topics are being discussed is the question of how to react to interviewees expressing opinions of a racist, sexist or in any other way offensive or illegal nature. While scholars have long favoured an approach that tried to be non-judgemental, it must also be considered that such a behaviour could be seen as quietly agreeing.

As there was a limited period of time available for conducting the interviews, it was decided to use semi-structured interviews in order to get the necessary information while still allowing the interviewees to focus on what they consider essential.

3.1.3 Development of the interview guideline

As indicated in the introduction to chapter 3 on page 47, a comprehensive literature review was the first step of this thesis. The knowledge gained during the literature review was subsequently used to create the interview guideline.
The interview guideline was structured in nine categories that covered the topics that seemed to be relevant for answering the research question and getting a better understanding of the topic (the interview guideline is attached in appendix A on page 180).

The structure of the interview guideline was designed as follows:

- 1. Company information
- 2. Purchasing tasks
- 3. Organisation of the purchasing function
- 4. The purchasing process
- 5. Qualification, skills and training
- 6. Gender aspects in purchasing
- 7. Suppliers: Integration and information exchange
- 8. Environmental conditions
- 9. Vision 2025

3.1.4 Interviewees

There has been a total of 18 interviews conducted as indicated in Table 3.1 on the following page.
There was a matrix defined prior to contacting possible interviewees that defined which industries and functional areas were required.

The functional areas for the interviews have been chosen in order to get a balanced and well-rounded impression. Eventually, it was possible to find professionals from five different functional areas. However, many of our interviewees had professional experience in other functional areas as well which helped us see the involved issues from different perspectives and cast light on them from different angles.

Industry wise, we tried to cover a set of industries as diverse as possible. There have been conducted interviews with senior consultants from two renowned strategic management consulting firms in the first step. These two interviewees had both more than 10 years experience with purchasing strategy and transformation projects in various industries and helped us gain a general understanding of industrial procurement activities. Subsequently, there have been conducted interviews with professionals from various industries. Executives of both, private and

public companies have been interviewed as well.

Table 3.1: Categorization of interviewees

Industry\Function	*Management*	*Controlling*	*Procurement*	*R&D*	*Sales*
Transport	1				
Process Industry	1	1			
Mechanical Engineering			1	1	
Hightech	1		2	1	
Public	1		1		
Food	1		1		1
Plant Engineering	1		1		
Consulting	2				
Total	8	1	6	2	1

3.2 Qualitative content analysis

Mayring [72] define qualitative content analysis as ”an approach of systematic, rule guided qualitative text analysis, which tries to preserve some methodological strengths of quantitative content analysis and widen them to a concept of qualitative procedure”[72]. Qualitative content analysis therefore tries to provide a framework for systematically analysing texts or other pieces of communication. It aims at analysing texts without losing their context of communication and provides the necessary rules and step-by step approaches.[72]

Qualitative content analysis tries to bundle the advantages of quantitative content analysis methods with the benefits of qualitative approaches towards content extraction. Mayring [72] emphasize four points that make qualitative content analysis the method of choice:

- Well defined study focus:
  Qualitative content analysis enable the researcher to focus attention specifically on one aspect of the text that should be analyzed. Such aspects can include the communicators feelings or experiences as well a the situation of the text production, the text itself or the perceived effects of the piece of communication.

- Systematic analysis:
  Qualitative content analysis provides a framework that enables the researcher to focus on the aspects of the text that should be analyzed. This framework includes a step-by-step model, well defined research procedures and guidelines on how to prepare the texts for subsequent qualitative content analysis activities.

- Well defined categories:
  Categorisation of test-pieces and subsequent reduction and generalisation is the core of the qualitative content analysis method. Every piece of information that seems relevant for answering the pre-defined research question is categorized. Categories need to be carefully defined. This category definition process can be done inductively, deductively or via a hybrid categorization process that combines the benefits of a inductive and a deductive approach.

- Reliability:
  Qualitative content analysis offers tools to measure and increase the reliability and comprehensibility of the method. Such methods include but are not limited to category comparison between two or more researchers or statistical tools.

Category development is one of the most important steps, it should be discussed in greater detail: As indicated above, category development can be done either inductively, deductively or by using a hybrid approach. As categorization is the core of the method, these approaches should be explained in more detail.

Inductive category development Inductive category development is an approach that aims to develop categories based on the text itself. Therefore, the categories are tailor-made for the piece of communication to be analyzed.
In order to efficiently carry out category-building, criteria must be defined that clearly define how categories are built. It has to be stretched that the task of category-building is an iterative approach. Therefore, categories will have to be refined, merged and split in separate categories in order properly capture all relevant pieces of information. Eventually, categories will be condensed to main categories.[72]

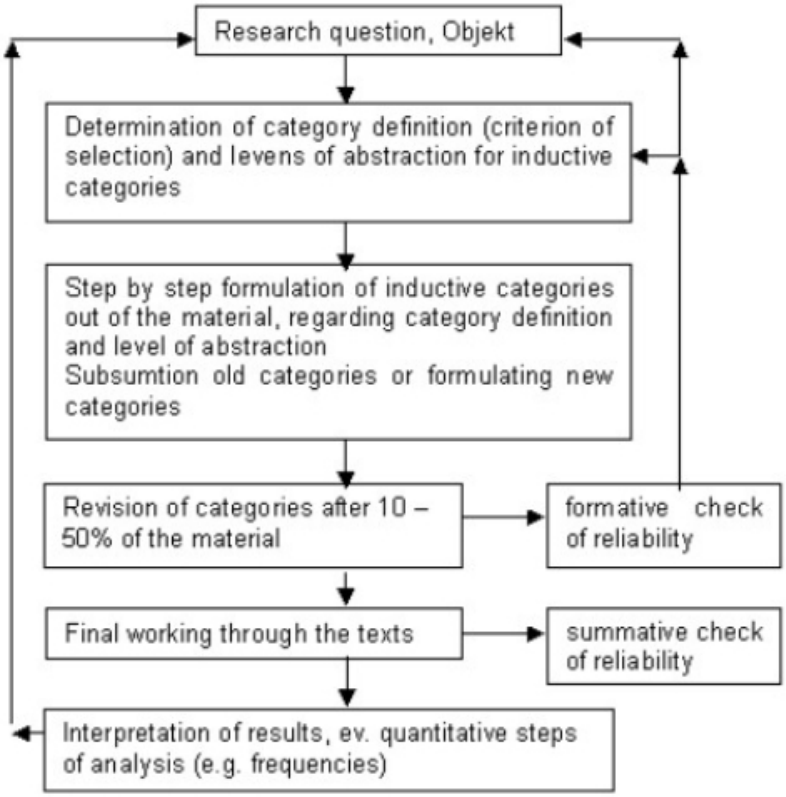

Figure 3.2: Framework for inductive category development[72]

Deductive category development While inductive categorization approaches try to create categories based on the text itself and only define criteria for categorization-building prior to the categorization, deductive categorization develops categories first and tries to allocate the pieces of information to the right categories.
Therefore, as those categories have to be developed beforehand, conducting a comprehensive literature review is a necessary requirement for applying deductive categorization approaches. Subsequently, categories are assigned to a part of the text.
It is essential that it is clearly defined which text passaged is coded with a specific category. Therefore, the definition of coding rules must be completed before the coding process itself is conducted.[72]

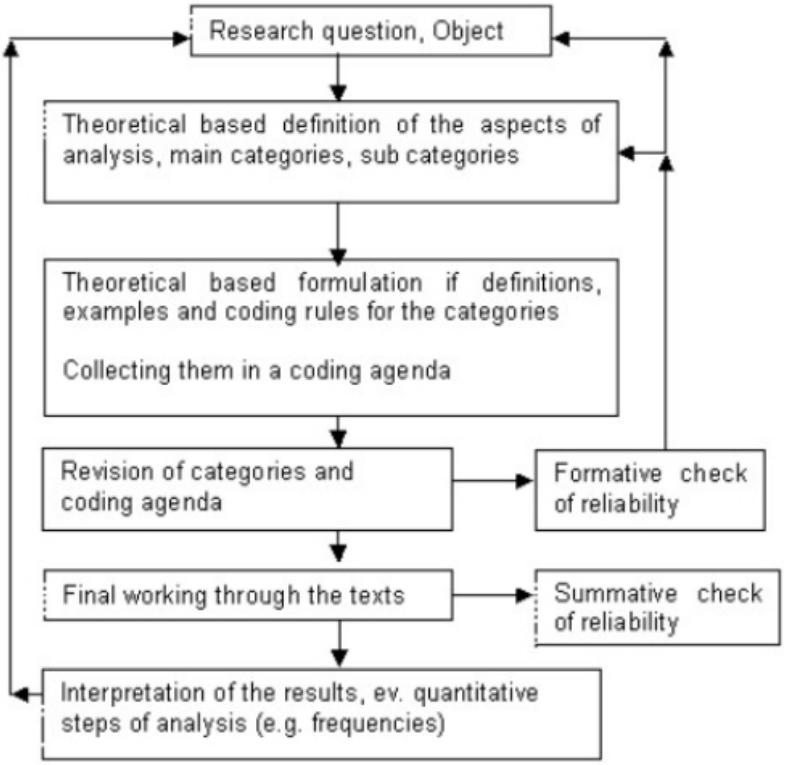

Figure 3.3: Framework for deductive category development[72]

Hybrid approach In order to find the optimal approach towards category development, a hybrid approach has been applied for developing the categories for this thesis.
First, a deductive approach was applied in order to get categories that were later refined and adapted according to the information that was extracted from the interviews. There has already been a quite intensive literature review conducted before the interviews were started in order to design a questionnaire for the semi-structured interviews and get a comprehensive understanding of the issue. The questionnaire was based on this literature review and covered the topics that were perceived to be relevant for answering the research question. Therefore, the questionnaire was used as a basis for category development.

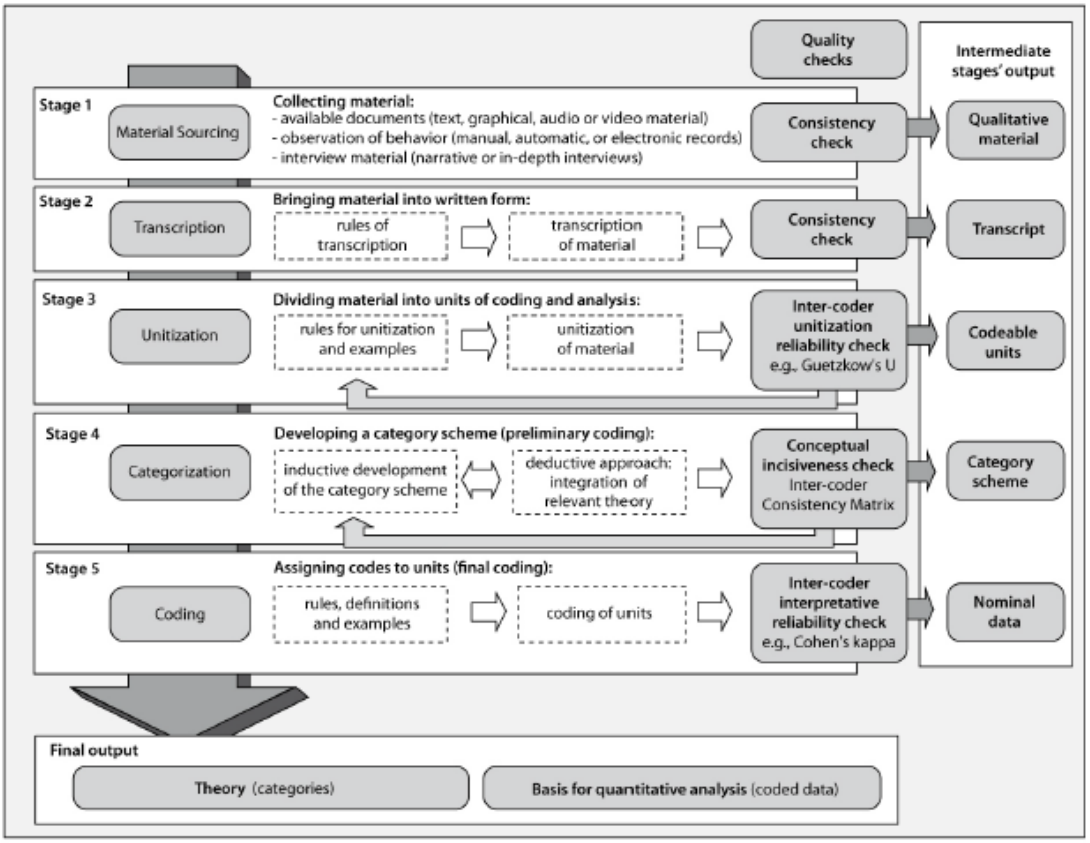

Figure 3.4: Framework for the qualitative analysing process[101, pp. 35]

Srnka and Koeszegi [101] define a five step process for analysing qualitative data. The process starts with data collection and covers all necessary tasks for transforming the raw data to coded material that can be used as either a basis for subsequent empirical research or as a result by its own. This process is defined as follows:

1. Material sourcing:
   The first step aims at collecting all the data and material necessary. As all further results are based on the collected data, this is a crucial step and it must be emphasized that the quality of the results to some extent always depends on the quality of the collected material.
   Data that is suitable for qualitative analysis includes data that is readily available such as texts, graphics, pictures, tables or audio files as well as data that is sourced specifically for the purpose of answering the research question. Methods for acquiring data that is not available include conducting interviews as well as observation of behaviour.
   While data that is available in written form is usually more comfortable to analyze as there is no need to conduct transcriptions, language issues have to be considered as well. Gen-

erally, data, written or audio, should preferably be in the respondent's mother tongue as this makes it easier to analyze small facets that could be lost in case the respondent uses a language other than his or her native language.
There should be a consistency check conducted that helps to make sure the dataset has the required quality.

2. Transcribing:
   Transcribing data that is not available in written form is the second step of the process. In order to do get consistent data, there should be transcription rules defined.

   Similar to the first step, there should be a consistency check conducted in order to ensure all quality standards are fulfilled.

3. Unitization:
   Unitization means dividing the material in units of a size that makes them suitable for the subsequent coding process. While Srnka and Koeszegi [101] stretch that the definition of the unit size is usually not conducted explicitly but "evolves implicitly rather than being determined explicitly"[101, pp. 36], it can still be seen as a vital step for systematically analysing the data.
   While the unitization process is rather simple for data that consists of short statements of only a few words, it is more complex for longer texts such as transcriptions of interviews. Srnka and Koeszegi [101] suggest to use "thought units" meaning units that are not defined by a certain length but rather by the fact that they represent an idea or a thought that has been communicated.

4. Categorization:
   As underlined in 3.2 proper categorization is the maybe single most important step of qualitative content analysis.
   Categorization aims at meaningfully structuring the data "by grouping the qualitative material in theoretically insightful ways"[101, pp. 36]. Srnka and Koeszegi [101] stretch that in contrast to the coding process itself (meaning the process of assigning the pre-defined categories to the text) category development and definition is a process that requires a high level of knowledge, skill and creativity.
   Furthermore, Srnka and Koeszegi [101] underline the importance of properly developing categories and suggest to use an hybrid approach as suggested in 3.2. Furthermore, they emphasize that category defining is an iterative approach.

5. Category assignment:
   Finally, when either all categories have been defined (when using a deductive category definition approach) or rules for category definition have been developed (for an inductive approach) the text units can be assigned to categories.

3.2.1 Analysis of the interviews

The analysis of the interviews was one of the most crucial steps in this thesis. Due to the large amount of available material, the transcription, code development, coding and proposition development took about one and a half months.
Fortunately, a student that was writing a bachelor thesis was able to help transcribing the interviews and coding the material.

A transcription is the written representation of a speech. While a transcription can perfectly well represent what was said, it fails to describe the factors of influence that go beyond that. Such factors include mimics or gesticulation.
The focus of the transcription of the interviews was on the correct representation of the content. Therefore, it was not tried to cover gesticulation, mimics or any other factor that goes beyond the pure content. As suggested by Pehl and Dressing [82], the following transcription rules were used in order to get comprehensible results:

- The interviews are transcribed word by word. Whenever dialect is used, the word is translated into standard German. If it is not possible to translate the dialect into standard German, the dialect is transcribed.
- Words that have been merged in dialect are transformed into standard German words with the same meaning. For example, ”hamma” is transformed to ”haben wir”.
- In case a sentence contains syntactic errors due to the use of dialect, the sentence is adapted.
- In case a sentence is aborted, it is tried to smooth the transcription by inserting the missing words in square brackets.
- In case it is not clear when a sentence was finished due to unclear pronunciation, it is tried to capture thought units.
- In case one person gives a signal of understanding (ah, oh, ok, ja...) while the other one is talking, this signal is not transcribed.
- Every utterance gets an own paragraph. Utterances from the interviewer start with ”I:”, utterances from the interviewee with the first letter of his or her last name (for example ”M:” for Max Mustermann).
- Words that can not be transcribed properly due to acoustic issues are highlighted with a question mark.
- The transcript file is saved using the name of the company and the interviewee.

The transcriptions were conducted using the ”VLC Media Player”. There were short-cuts created for going back and playing slower or quicker. The time necessary for transcribing the interviews was approximately six times as long as the time of the audio record. Generally, it can

be said, that the worse the quality of the recording, the longer will be the required time for the transcription. There was a correction check conducted after the transcription in order to avoid typos.

As indicated in 3.2 an hybrid approach was used in order to define categories. At first a deductive approach towards categorization was used. As there had already been a comprehensive literature review conducted for creating the interview guideline, the deductive categorization was based on the interview guideline.

The original categorization framework included 7 categories with 30 subcategories (compare Table 3.2 on the next page)

Table 3.2: Categories based on questionnaire

Category	*Subcategory*
Company information	Industry
	Revenue
	Purchasing volume
	Employees in purchasing
Environmental conditions	Influence of IT systems
	Market environment
	Opening of new markets
Qualification and skills	Career development
	Skills of operative purchasing personnel
	Qualification of operative purchasing personnel
	Education of operative purchasing personnel
	Training of operative purchasing personnel
	Skills of strategic purchasing personnel
	Qualification of strategic purchasing personnel
	Education of strategic purchasing personnel
	Training of strategic purchasing personnel
Organisation of the purchasing function	Contribution of purchasing to corporate success
	Integration in organizational structure
	Internal status of the purchasing function
	Internal organization of the purchasing function
Tasks of the procurement function	Operative tasks
	Strategic tasks
	Changes in tasks
Functions in the procurement process	Integration into product development
	Know-how contribution of other department
	Know-how contribution of the purchasing department
	Maverick buying
	relevant functions for the purchasing process
Suppliers	Information exchange with suppliers
	Integration of suppliers

These categories have been used as a starting point for the subsequently applied inductive

approach. Whenever a piece of information seemed to be relevant for answering the research question but did not fit in an existing category, a new category was developed. This process required an iterative approach that included merging and splitting of categories as well as the introduction of new categories.

In order to ensure the process of merging and splitting categories is done in a systematic way, category matrices were generated that showed whether the same references were assigned to different categories. Table 3.3 shows the category matrix for the category "Tasks of the procurement function". Obviously, there are numerous references assigned to multiple sub-categories (see numbers in red in Table 3.3. These references have been double-checked in order to avoid double categorization and make sure every reference is assigned to the sub-category it fits best.

Table 3.3: Category matrix for the category "Tasks of the procurement function"

Subcategory	1	2	3	4	5	6
1 : Distribution of tasks	**12**					
2 : Automation of operative tasks	0	**15**				
3 : Innovation	0	0	**15**			
4 : Operative tasks	**2**	**3**	0	**16**		
5 : Strategic tasks	**1**	**1**	**3**	**9**	**72**	
6 : Changes in tasks	**1**	**3**	**3**	**1**	**4**	**32**

While it was not possible to totally avoid double categorization as some pieces of information are quite obviously necessary in multiple sub-categories, it was still possible to use these category matrices as a tool to systematically review and check the categorization process.

Finally, when the assignment of the text passages to the categories had been finalised, a total of seven categories with 29 subcategories had been defined (compare Table 3.4 on the following page).

Table 3.4: Final categories

Category	*Subcategory*
Company information	Industry
	Revenue
	Purchasing volume
	Purchasing material
	Employees in purchasing
Environmental conditions	Influence of IT systems
	Market environment
	Compliance in purchasing
Qualification and skills	Career development
	Skills of purchasing personnel
	Qualification of purchasing personnel
	Education of purchasing personnel
	Training of purchasing personnel
	Job rotation
Organisation of the purchasing function	Contribution of purchasing to corporate success
	Integration in organizational structure
	Internal status of the purchasing function
	Internal organization of the purchasing function
Tasks of the procurement function	Operative tasks
	Strategic tasks
	Changes in tasks
	Distribution of tasks
	Automation of operative tasks
	Innovation
Functions in the procurement process	Integration into product development
	Know-how contribution of other departments
	Know-how contribution of the purchasing department
	Maverick buying
	Relevant functions for the purchasing process
Gender	

During the category assignment process, a total of 659 text passages were assigned to the

respective categories.

Table 3.5: References for each category

Category	*References*
Company information	40
Environmental conditions	92
Qualification and skills	144
Organisation of the purchasing function	95
Tasks of the procurement function	186
Functions in the procurement process	102
Total	659

In order to give the distinguished reader a better understanding of how the coding process has been conducted, it should be demonstrated with an example:

Table 3.6 on the next page shows the coded answer to the question how the purchasing function is usually organised and how tasks are distributed to the various employees. This is obviously a quite open question that allows the interviewee to emphasize on what he or she thinks is particularly important. The example is from one of the interviews that was conducted with consulting professionals in order to get a basic understanding. As indicated by Srnka and Koeszegi [101] some aspects can be lost if the interviewee is not interviewed in his or her native language. In this case it was not possible to conduct the interview in the native language of the interviewee, therefore, it was decided to do it in German language.

Table 3.6: Coding example

Text	*Category*
Ja, also, ich glaube, heute hast du in im operativen Einkauf traditionell, wir nennen es operative Einkäufer oder Material Manager, die den Materialien hinterherlaufen, das sind eher die low-skillset Rollen.	Qualification, Skills and Training
Und dann gibt es im strategischen Einkauf die Commodity Manager, das ist ganz klassisch. Das können die Lead Buyer sein, die über mehrere Standorte koordinieren oder, wenn es zentraler Einkauf ist, die zentrale Rolle. In der Zukunft kommt eine wichtige Rolle dazu, das ist die strategic supply manager Rolle - es kommt eine wichtige Rolle dazu, das ist die Strategic Supplier, die SRM - Supplier Relationship Rolle, die auch sehr stark auf Innovation mit Lieferanten fokussiert sein.	Internal organization of the purchasing function
Es werden die strategischen Rollen, das wird aus diesen strategischen Rollen wachsen, diese operative Rolle, die wird weiter reduziert bzw. vl sogar, also mit Automatisierung und Offshoring, wegkommen.	Changes in tasks
Oder halt zum Beispiel diese Zentren outgesourct, wo man mehr Skaleneffekte über mehrere Unternehmen hat. Also das gibt's auch. Also man könnte zum Beispiel in einem großen Outsourcing Center das haben, die dann diese Bestellungen machen. Ähnlich könnte man das für diese Kategorien machen, die es halt zum Beispiel überall gibt. Also jedes Unternehmen kauft Büropapier, kauft IT, Computer und so klassische Services, also das kann man auch von diesen Centren abbilden lassen. Also wir sehen immer mehr Trends zu diesen Sourcing Netzwerken. Ich glaube, was sich da indirekt eignen würde, also im Prinzip Outsourcing und Offshoring.	Strategic tasks

Subsequently, the thought units that were assigned to each category have been paraphrased, reduced and and generalised in order to condense the information and focus on the core message. As the categories and even the subcategories covered a quite broad range of topics in some cases, it was necessary to condense the information in more than one proposition. These statements have been formulated in a way that makes it possible to verify them empirically whenever possible. The process of paraphrasing, reducing and generalising was done in one step as the amount and length of the available interview transcriptions did not allow another approach.

All propositions are formulated in a way that allows them to be validated empirically in order to facilitate the subsequent survey design. Furthermore, there were short names assigned to each proposition in order to facilitate the progress (for example ”Category manager” as a short form for ”There is the role of a category manager”).

The process of paraphrasing, reducing and generalising should be demonstrated by the same example as the category assignment process (compare Table 3.7 and Table 3.8). While there are no propositions assigned to the first subcategory (”Qualification, Skills and Training”) there are four propositions assigned to the second subcategory (”Internal organization of the purchasing function”) and propositions to the third subcategory. Therefore, the second and the third subcategory are used.

Table 3.7: Reduction of the category ”Internal organization of the purchasing function”

Text	*Proposition*
Und dann gibt es im strategischen Einkauf die Commodity Manager, das ist ganz klassisch.	There is the role of a commodity manager.
Das können die Lead Buyer sein, die über mehrere Standorte koordinieren oder, wenn es zentraler Einkauf ist, die zentrale Rolle.	There is the role of a lead buyer.
In der Zukunft kommt eine wichtige Rolle dazu, das ist die strategic supply manager Rolle - es kommt eine wichtige Rolle dazu, das ist die Strategic Supplier, die SRM - Supplier Relationship Rolle, die auch sehr stark auf Innovation mit Lieferanten fokussiert sein.	There is the role of a SRM manager The relevance of the SRM Manager gains importance.

Similarly to the assignment of propositions to the subcategory ”Internal organization of the purchasing function”, propositions are assigned to the next subcategory, ”Changes in tasks”.

Table 3.8: Reduction of the category ”Changes in tasks”

Text	*Proposition*
Es werden die strategischen Rollen, das wird aus diesen strategischen Rollen wachsen, diese operative Rolle, die wird weiter reduziert bzw. vl sogar, also mit Automatisierung und Offshoring, wegkommen.	There is a trend towards automatizing operative tasks. There is a trend towards offshoring and outsourcing.

Table 3.9 shows the proposition matrix for the subcategory ”Internal organization of the purchasing function”. The numbers in the matrix represent the number of references for each proposition. Numbers that are not in the diagonal of the matrix represent references that have been assigned to multiple propositions. Usually, this represents a weakness in the definition of the propositions and should therefore be avoided. The example in Table 3.9 shows that the proposition ”Commodity Manager” has partly the same references as ”Materialgruppenorganisation”. Therefore, the proposition definition was revised and these two, very similar propositions were merged.
Similarly, there was only one reference for the proposition ”Prototypeneinkauf” which was also part of ”Projekteinkauf”. Therefore, ”Prototypeneinkauf” was subsequently merged with ”Projekteinkauf”.

Table 3.9: Proposition matrix for the subcategory ”Internal organization of the purchasing function”

Proposition	1	2	3	4	5	6	7	8	9
1 : O Commodity Manager	**10**								
2 : O Einkaufscontrolling	0	**1**							
3 : O Indirekter Einkauf	0	0	**1**						
4 : O Lead Buyer	0	0	0	**4**					
5 : O Materialgruppenorganisation	**2**	0	0	0	**6**				
6 : O Projekteinkauf	0	0	0	0	0	**6**			
7 : O Prototypeneinkäufer	0	0	0	0	0	**1**	**1**		
8 : O SRM Manager	0	0	0	0	0	0	0	**1**	
9 : O Trennung strategisch und operativ	0	0	0	0	0	0	0	0	**6**

Eventually, after the process of merging, reducing and developing propositions had been finalized, a total of 358 propositions had been derived (compare Table 3.10 on page 77).

The coding and analysing process for the qualitative content analysis was done by using qualitative data analysis software. While both, ATLAS.ti and NVivo 10 were considered and evaluated, it was finally decided to use NVivo 10 due to its user-friendliness and advanced analytic tools.

Using a qualitative data analysis tool like NVivo 10 helps the researcher to systematically carry out the analysis process and facilitates discovering patterns that might otherwise be undiscovered. [55] The use of NVivo 10 was specifically helpful to for the process of inductively creating categories as this process required a considerable effort to merge, split or re-arrange categories. NVivo 10 was very helpful to carry out these tasks in a systematic and structured way. Furthermore, NVivo 10 provides advanced empirical analysis tools and is capable of providing the used sources in a way that allows them to be used without further modifications.

3.2.2 Topics of the survey

As indicated in 3.1.4 on page 51 a total of 18 interviews has been conducted. These interviews were evaluated using qualitative content analysis and the results were used for creating the survey. Moreover, the results from the content analysis can be seen independently from the quantitative survey. A quick overview over the most important findings of the interviews will be presented on the next pages.[1]

In order to give a structured overview, the key results will be discussed separately for the categories defined in Table 3.4 on page 62.

Automation of operative tasks Interviewees have indicated that there is a trend to automatize operative procurement tasks. One interviewee, a senior manager in a global management consultancy firm, stated that there is a trend towards reducing operative tasks to transactions that can be automatized more easily.[2] Another aspect that seems to be of great importance is the influence of advanced ERP systems on the automation of operative purchasing tasks: One of the interviewees underlined the importance of integrating ERP systems with suppliers for automatizing operative tasks[14], one interviewee hinted that modelling all processes via IT was the key to automatizing processes[6] and one interviewee stretched that automation has already been an important trend in the last years[10]. Another interview emphasized that it is of importance to closely integrate suppliers to automatize processes.[5]

Innovation While one interviewee stated that the purchasing function has to focus less on price aspects but more on aspects of innovation and quality for making sourcing decisions[2], other interviewees defined the contribution of purchasing to being innovative more via its capability to integrate external know-how: One interviewee emphasized that bringing in know-how of suppliers in product development is one of the key tasks of purchasing.[14] Another interviewee stretched the importance of the purchasing function bringing in market know-how for a product innovation process.[3] Another interviewee emphasized on two different roles the purchasing function has to play in the innovation process: Either as the function that brings in existing supplier innovation into development processes or as the function to find suppliers capable of developing innovations for existing problems.[9]

Operative tasks One interviewee stretched that operative tasks should be simplified as much as possible in order to facilitate automation and off-shoring or outsourcing. Furthermore, the interviewee stretched that simplified tasks in operative purchasing allow to assign relatively low-skilled labour to operative purchasing thus reducing labour cost.[2] Furthermore, there seems to be a trend to allow other parties to make orders themselves via e-platforms and framework agreements.[11] Other interviewees emphasize that outsourcing of operative tasks might not

[1] As the the topics discussed in the interviews are both, results on their own as well as a pre-work for the survey, they shall be displayed in the methods chapter. However, it should be noted that the interview evaluations go beyond of what can be considered a "pre-work" and are a substantial part of the results of this thesis as well.

have the benefits it promises to have: One interviewee stretched that outsourcing of operative tasks is actually more expensive than keeping them in-house when evaluating it applying a total-cost-of-ownership approach and including the possible cost of decreasing customer dissatisfaction.[14]
Another interviewee stretched the importance of clearly defined processes and well tested systems. The interviewee furthermore underlined that a well working operative purchasing department is a necessary requirement for a well working strategic procurement.[6]
The key tasks of operative procurement can be considered to make sure the right material is on the right time in the right quantity in the right quality at the right place. One interviewee stretches that making sure suppliers deliver reliably is getting more important.[7]
Another interviewee stretches that it can be beneficial even for strategic buyers to be involved in operative purchasing to some degree in order to be informed of the latest systems and trends in operative purchasing.[8]

Strategic tasks One of the most important strategic tasks of the purchasing function seems to be to build and lead cross-functional teams: One interviewee stretched that the purchasing function is ideally suited for moderating and leading cross-functional units and teams[2], another interviewee stretched the moderating role of the purchasing function in development processes where R&D and a supplier's development department work together.[3]
Naturally, supplier management activities are of enormous importance as well: While the importance of supplier evaluation and development was generally acknowledged, some interviewees emphasized that these activities should be focussed on key suppliers and C-part suppliers should be excluded.[12] Another interviewee underlined the importance to convince the engineering department of using existing suppliers in order to keep the supplier base small. Naturally, a sophisticated supplier evaluation process that involves the feedback of all involved parties is a necessary requirement for such an approach.[15]
Another interviewee emphasized the importance of supplier market research and stated that this is one of the key tasks of the purchasing function. The interviewee stretched the importance of supplier market research for topics as diverse as risk management, supplier innovation or supplier search.[14]
With regards to risk management, interviewees defined the responsibility of the purchasing function mainly in terms of evaluating possible consequences of a supplier not being capable of delivering. Naturally, it is the task of the purchasing function to critically review these consequences and change sourcing strategies in case the consequences seem not to be acceptable.[14]
Furthermore, as indicated in 3.2.2 on the previous page, contributing to a company's innovation potential through bringing in external know-how is one of the key tasks of the purchasing function. Participating in the make-or-buy decision can also be seen in this context.[13] Furthermore, interviewees stretched that the purchasing function has to participate in the design of company-wide processes.[14]
Multiple interviewees underlined the importance of creating framework agreements that allow other departments to order independently of the purchasing department[3, 11]

Changes in tasks and distribution of tasks Interviewees stretched that the purchasing function has to concentrate increasingly on creating values and optimizing relationships with suppliers and less on the transactional part of the business.[2] Such a trend also means a shift in deployed purchasing resources away from operative purchasing towards strategic tasks.[3] However, interviewees also stretched that systematically creating cost reduction still is of tremendous importance.[2]
Furthermore, the separation between strategic and operative purchasing seems to get more rigid as operational tasks are increasingly reduced to transactional tasks that can be outsourced or automatized and strategic tasks are getting more and more demanding and require better trained personnel.[2]
Furthermore, knowledge of legal frameworks and necessary certificates seems to grow in importance.[9]
Moreover, the purchasing function must increase its level of flexibility with regards to developing sourcing strategies as different markets require different strategies.[4]
Especially in engineering driven industries, the purchasing function seems to be more and more involved in questions of a technological nature that have traditionally been beyond the area of competence of the purchasing function. Therefore, the nature of the purchasing function gets more technological.[5]

Career development The overall impression of all interviews is that career development and chances depend on the status of the purchasing function[2], on the growth of the company and especially in SMEs on possible changes in the organizational structure[12, 14].
One interviewee hinted that possible career prospectives are closely linked with the status of the purchasing function and on the role purchasing plays in corporate decision-making processes: In case the purchasing function is organized and implemented in a kind of ”old-school” way (meaning as a transactional function that merely carries out what has already been decided) the chances are naturally limited. However, in modern organizations that follow design-to-cost principles, have a high level of purchasing involvement in R&D and carry out strategic purchasing tasks, the chances are quite similar to the chance in sales, R&D or finance.[2]
Furthermore, beside the possibility for internal purchasing career development the chance to use purchasing as a steppingstone for working in other functional areas seems to be increasing.[5]
Moreover, chances to develop a career in the purchasing unit of another organization are existent, notably for professionals who have worked in an organization that is renowned for its purchasing excellence.[6]

Skills and qualification of purchasing personnel Three types of skills can be observed to be relevant: Commercial skills, technical skills and soft skills.
Commercial skills include the know-how about negotiations, contracting and analysing skills[2]. Necessary know-how includes an understanding of total-cost-of-ownership (TCO) approaches, knowledge of logistics and supply chain management[11] and know-how of ERP systems[12].
Furthermore, especially strategic purchasing professionals need project management skills.[11]
Concerning the necessary technical and technological know-how, there seems to be a big gap between what is understood to be technical skills in different industries. While there was a general understanding that technological know-how is necessary in order to ”speak the same lan-

guage" as engineers[2], especially for those purchasing professionals that are dealing with R&D issues[11], some interviewees considered product know-how as sufficient[4] other interviewees state that strategic purchasing professional need deep technological know-how that normally requires an advanced engineering degree.[3]
With regards to social skills, languages[11] are just as important as are flexibility, conflict management skills, communication skills or presentation skills. Furthermore, the ability to convince people seems to be essential.[2]
There seems to be consensus that globalization, global sourcing, off-shoring and the opening of emerging markets has increased the need for purchasing professional to speak foreign languages, especially English.[12, 13]
Furthermore, interviewees stretch that it is far more difficult to learn missing technical understanding than to gain commercial know-how.[5, 15]

Education and recruitment of purchasing personnel The education of operative and strategic purchasing personnel is increasingly seeing differences as strategic buyers are often required to have advanced degrees, mainly in business or engineering while operative purchasing professionals are many times only required to have a high-school degree or a finished apprenticeship.[2, 11, 13]
Especially as operative purchasing gets increasingly reduced to transactional tasks and automation is increasing, companies aim to reduce costs through recruiting lower skilled personnel for such roles.[2]
Meanwhile, as the purchasing function emerges, the role of the strategic purchaser gets more demanding and so do the education requirements: Many times, engineering know-how is as much a requirement as commercial know-how and companies try to recruit personnel with advanced engineering degrees and commercial experience[16].
While many companies have minimum requirements with regards to formal education, practical experience is still capable of compensating for a lack of formal education. Know-how of purchasing strategies and processes can still be very valuable.[7]
Strategic buyers are recruited externally as well as internally and operative buyers have the chance to become strategic buyers if they show the potential to be successful in a more advanced role.[3]
While there are some academic institutions in Austria that focus on supply chain management or procurement, there still seems to be a lack of educational offers.[11]

Training of purchasing personnel While the majority of interviews state that they implement a training systems that includes internal as well as external trainings[2, 11, 12], there seems to be a pattern of which kind of trainings are conducted in-house and which trainings are done externally:
While internal trainings often focus on industry specific or even firm specific topics[12]. Internal trainings are often considered to be more specific and better suited as the newly gained know-how is normally easier to apply.[5] Furthermore, internal trainings have the advantage to allow the participants to extend their internal network.[15] Many companies have built up internal training academies that aim to conduct all training related activities in a structured way.[3, 9, 14]

External trainings are preferred when the necessary resources or know-how is not available internally or when professional are prepared for a management function.[11, 15]. External trainings range from half day training that aim to help the participants gain know-how about a very specific issues to executive MBAs.[13]
Additionally, many companies implement job rotation schemes in order to enhance learning-on-the-job.[2, 12]

Contribution of purchasing to corporate success While interviewees stretch that there are numerous ways to measure the contribution of the purchasing function to corporate success, they also stretch that transparency is of utmost importance, no matter how the contributions is measured.[11] The introduction of ERP systems seems to have highly beneficial consequences in terms of transparency and ease to measure purchasing success[4].
One interviewee underlined the importance to consider changes in price that are beyond the area of influence of the purchaser such as changes in raw material prices and hinted that measuring the savings potential relatively to a index that represents changes in market prices should be the method of choice.[14]
Furthermore, it is necessary to underline that systems that measure the purchasing success should not be limited to measuring financial results but should also include quality and delivery indicators.[15]

Integration in organizational structure The general impression of the interviews was that the head of the purchasing function (CPO - chief purchasing officer) should be no more than one level below the board of the company.[2, 13] Some interviewees even stretch that the CPO should be part of the executive board.[11]
While the purchasing department is normally leading all purchasing related activities some companies seem to feature special purchasing units for some commodities that are not part of the general purchasing organisation. One interviewee, the head of purchasing of a leading rope manufacturer stretches that steel cables for ropes are bought locally at each factory[14] and the former head of a shared service center of a leading oil company underlines that crude oil procurement is a separate unit that has nothing in common with the purchasing of all other materials.[12]
With regards to centralization, there is a wide range of answers and there seems not to be a one-size-fits-all solution: While one interviewee explains that all procurement related activities are coordinated and implemented centrally[13] other interviews opt for a central organization that coordinated and defines the strategy while de-central organizations do the operative buying[15]. Some organization have de-central buying units that have to buy key parts with supplier that are selected centrally but buy everything else local-for-local.[3]

Internal status of the purchasing function The status of the purchasing function seems to be very industry and company size specific. While in the consumer goods industry, retail, pharmacy, IT or high-tech companies the purchasing function seems to enjoy a quite high status that is also manifested in the position of the CPO in the corporate structure, there still seems to be some potential for improvement in process industries and SMEs.[2, 11]
There was a consensus between most interviewees that the ratio between spend and revenue is

an important driver for the status of the purchasing function: The higher the spend ratio, the higher is in general the status of the purchasing function as its importance for corporate success increases.[2, 12]
Some interviewees stretch that the influence of the purchasing function is still ”behind the curtain”[13] and cannot compare with the status of sales or R&D, others stretch that this might also be true due to a lack ability of purchasing professionals to raise awareness for their many times essential influence on corporate profits.[14]
Nevertheless, most interviewees suggest that the status of the purchasing function is generally growing as the importance of sourcing in general and external know-how and innovation in particular increases.[3, 6]

Internal organization of the purchasing function The majority of interviewees stated that the purchasing function in their companies is structured in strategic and operative units that focus on specific commodities or groups of commodities.[2, 11, 15]
Additionally, the use of the lead buyer system is quite common. Sometimes, de-central commodity managers are lead buyer[11], sometimes lead buyer roles are more centralized[15].
Furthermore, many organization have a role that focusses on dealing with SRM issues.[2]
Moreover, especially engineering driven companies where R&D plays an important role seem to have the role of a project buyer that is assigned to a specific development project and handles all purchasing related issues of the project, coordinates with the relevant lead buyers and makes sure purchasing interests are represented in the project and design-to-cost goals are met.[3, 6]
Moreover, some organization have even special project buyer that focus only on prototype related purchasing tasks, so called prototype buyer. The objective of a prototype buyer is to make sure the purchasing function is capable of influencing development projects at a very early stage already.[3]

Integration into product development Multiple interviewees stretched the importance of being involved early product development processes in order to make sure design-to-cost principles are used. Furthermore, the purchasing department has to make sure external know-how is available when required.[2] Moreover, the purchasing department should be capable of participating in the specifications development process in order to ensure suppliers are capable to produce the required parts at a competitive price.[4, 14]
Another interviewee emphasized that there needs to be a clearly defined process that regulates when and where purchasing has to be involved.[14] Furthermore, another interviewee, the R&D manager of a mechanical engineering company stretched the importance of involving purchasing in all stages of product development as usually more than two thirds of the cost are fixed after design freeze.[16]
One interviewee vowed that the purchasing department should be involved in the offer phase as well in order to allow offers to be competitive.[7]

Contribution of the purchasing department The purchasing function needs to be the enabler that makes sure every relevant stakeholder is involved in the process. Subsequently, the purchasing function must have the lead of the cross-functional teams that are build. citepinterview10

Furthermore, the purchasing function must bring in its market and procurement strategy know-how in the purchasing process. Additionally, its know-how about legal aspects and risk management is required.[7, 9]

Contribution of other departments While product marketing is necessary for evaluating whether some sourcing products are acceptable to customers and the manufacturing department is responsible for defining quality and manufacturing standards, it is also necessary to involve logistics for defining the value chain and finance and controlling for measuring financial aspects.[2]
Another interviewee that used to lead a shared service purchasing practice of a large international energy commodity company emphasizes that is is essential to leave behind a kind of ”functional thinking” and think in processes instead.[12]
Other interviewees underline that the R&D department needs to contribute its technology know-how, the sales department its know-how of customer expectations, manufacturing the production know-how and the finance and legal department the know-how of financial details and contract law respectively.[5]

Relevant functions in the purchasing process While several interviewees stretched that the purchasing function is a interface function that deals with nearly all functional areas in the company[11], the coordination with product development, manufacturing and product marketing seems to be particularly important.[2] However, one interviewee also stretched that it might be beneficial not to define rigid interfaces between different departments but instead to focus on cross-functional teams that work together directly.[2]

Maverick buying Multiple interviewees emphasize that indirect material is more prone to maverick buying than direct material. Especially office commodities, maintenance material or CAPEX commodities are often bought without purchasing involvement. Furthermore, services like consulting services, translation services or marketing services can be critical.[2]
Moreover, interviewees stretch that the introduction of ERP systems has contributed to the reduction of maverick buying.[5, 11]
Measures to avoid maverick buying include the widespread use of framework agreements to enable buying processes being conducted without purchasing involvement[2], the use of transparent processes[7] or increased flexibility and pace of purchasing processes[3].

Influence of IT systems As indicated in 3.2.2 on page 67, IT systems have a huge impact on purchasing, not only with regards to how the purchasing function works but also with regards to the existence of operative purchasing as a whole.
Furthermore, IT systems contribute to rising transparency through processes and transactions, facilitate reporting and enable purchasers to analyze things more sophisticatedly using advanced analytic or big data analysis tools.[2] The overall content of the interview series was that ERP systems that are interconnected with supplier are not as widespread as one would think: One interviewee stated that the cost to implement these connections is too high for SMEs[14] while other interviewees added that EDI connections and integrated ERP systems are only used for

selected C-part suppliers[12, 15].
Other interviewees underlined the importance of on-line sourcing and SRM platforms that sometimes also allow the supplier to take a self-assessment for the regular supplier evaluation. Furthermore, such platforms can also be used as informations exchange platforms.[12, 13, 15]

Market environment Multiple interviewees stated that the opening of new markets, especially emerging markets has had a huge influence on procurement activities, both with regards to new sourcing markets and new sales markets.[11, 13] However, the influence of these developments go far beyond activities like supplier search or evaluation but also include the need to closely observe FOREX markets and balance the expenditures in supply markets with the revenues in sales markets or the need to create more sophisticated forecasting tools in order to cope with increasingly volatile resource prices.[9, 15]
Furthermore, risk management gains increasingly in importance as supply chains are getting more globalized and delivery times increase.[11] Moreover, managing regulatory affairs increases in complexity.[15]
With regards to necessary language skills, globalization increases the need to speak the languages of emerging countries and the need to be comfortable in an international environment and understand differences in culture and society.[11, 14]
Additionally, globalization tends to increase the cost pressure as new competitors are entering markets and try to capture market shares from established players. Therefore, companies have been increasingly seeking to reduce cost through outsourcing or off-shoring in low cost countries.[3]

Compliance in purchasing The general impression of the interviews is that compliance with internal regulations and legal aspects has rapidly gained importance. In many companies, employees have to sign a code of conduct. Furthermore, compliance standards have to be implemented by suppliers as well and regulations and legal aspects are globalized.[13] Notably public companies have to apply particularly strict regulations in order to increase visibility and are increasingly applying four-eyes principles and other, advanced tools.[4]
Some of our interviewees even change commodity managers after a few years in order to avoid any kind of fraternization between commodity managers and long-term suppliers.[6] Furthermore, detailed and formalized processes contribute to buyers complying with internal and external regulations.[6]

Gender aspects of procurement The proportion of women working in the purchasing function seems to be very industry and geography specific. While there seems to be a relatively high proportions of women in high-tech industries, especially more ”technical” purchasing tasks are still an area that features a low proportion of women.[2]
Another interviewee, the female leader of a purchasing department managing a spend of more than two billion Euro, underlined that qualification is the only relevant criteria for making personnel decisions. However, she stated that she does not consider quotes that regulate the proportion of women to be an adequate instrument for promoting females.
Multiple interviewees emphasized that the difference in the amount of women and men working

in purchasing can be explained by the different proportion of men and women in relevant fields of study, especially in technical studies.[12, 13, 14]
However, it is interesting to see, that even in organizations where the overall ration between men and women is approximately balanced, strategic buyer positions and managing roles seem to be occupied mostly by men.[4, 13]

Summary The word cloud in 3.5 represents the most important topics that have been discussed in the interviews: The purchasing function is the interface between internal and external partners, between R&D, manufacturing, marketing and suppliers. It aims to create benefits for the whole company. It has to balance different and many times conflictive interests which requires a sound education of technological and commercial aspects of the business as well as man-management skills. It has to optimize long-term, strategic aspects of the business as well as the operative day-to-day business. As the purchasing function grows in relevance and status in the company, the separation between strategic and operative purchasing grows, the responsibility of the purchasing function grows, its ability to be a creator instead of an executer grows and the skill-set for purchasing professional gets more demanding.

Figure 3.5: Word cloud of the interview transcriptions

3.3 Survey

Several on-line survey tools such as ”www.surveymonkey.com”, ”www.surveygizmo.com” and ”www.socialsci.com” were considered for the on-line survey. After considering the pros and cons of the various tools, ”www.socialsci.com” was selected to be the best tool for the purposes of this survey.

3.3.1 Question development

The questions for the survey were developed based on the propositions derived from the qualitative content analysis process. For the purpose of question development the propositions have been rearranged in the following categories:

Table 3.10: Propositions derived from the interview analysis

Category	*Numberofpropositions*
Tasks of the procurement function	186
Organisation of the purchasing function	55
Qualification and skills	92
IT	10
Environmental conditions	7
Gender	6
Total	358

Of these 358 propositions, 309 have been used for developing questions and 49 have been considered to be either irrelevant or not relevant enough. These 309 propositions have been rearranged slightly where appropriate. For the design of the survey, questions have been developed based on the propositions or the propositions have been used to be validated through Likert scale questions.

Table 3.11: Propositions that were used in the initial questionnaire development

Category	*Numberofpropositions*
Tasks of the procurement function	136
Organisation of the purchasing function	54
Qualification and skills	93
IT	12
Environmental conditions	8
Gender	6
Total	309

In the initial question development process, a total of 110 independent questions has been developed as indicated in Table 3.12. However, it has to be considered that Likert batteries that are used to validate multiple propositions are considered one independent question. The questions concerning general information have not been derived from the content analysis of the interviews but have been added in order to make sure that the subsequent statistical evaluation allows proper segmentation with regards to industries, education, age, gender, company size, sourcing markets and hierarchy level.

Table 3.12: Independent questions after the initial questionnaire development

Category	*Numberofquestions*
General information	12
Tasks of the procurement function	26
Organisation of the purchasing function	23
Qualification and skills	24
IT	11
Environmental conditions	6
Gender	3
Total	110

As the amount of questions exceeded the acceptable amount of questions with regards to time required to take the survey, a critical evaluation of all questions was conducted that aimed at reducing the amount of questions to a quantity that allows survey takers to finish the survey in approximately ten to fifteen minutes. The evaluation took the relevance of the questions towards answering the research question as the most important criterion.

Table 3.13: Questions of the finale questionnaire

Category	*Numberofquestions*
General information	17
Tasks of the procurement function	8
Organisation of the purchasing function	6
Qualification and skills	7
IT, environment, gender	3
Total	41

To give a concrete example how the question development worked, the coding and proposition development from table 3.6 on page 64, table 3.7 on page 65 and table 3.8 on page 65 shall be taken. There have been six propositions developed from this piece of text:

Table 3.14: Question development

Proposition	*Question*	*Question type*
There is the role of a commodity manager.	The purchasing function is organised in commodity groups	Checkbox
There is the role of a lead buyer.	The lead buyer concept is used.	Likert
	The lead buyer system is used more regularly in 10 years.	Likert
There is the role of a SRM manager	dropped	
The relevance of the SRM manager gains importance.	dropped	
There is a trend towards automatizing operative tasks.	Automatizing of operative tasks increases.	Likert
There is a trend towards outsourcing and off-shoring.	Outsourcing of purchasing tasks increases.	Likert
	Off-shoring of purchasing tasks increases.	Likert

Quite obviously, most of the ”questions” have been formulated in form of a propositions that can be agreed or disagreed with. Furthermore, as stated above, quite a considerable number of questions have been dropped whenever they did not seem relevant enough for answering the research question.

Pre-testing In order to verify whether all questions were understandable and unambiguous, a pilot study was conducted. Furthermore, the pilot study was used to find out the average time

needed for participating. During this pilot study, eleven persons tested the survey with regards to formulation, optical arrangement of questions, typos and orthography.

The feedback of the pilot study participants included information about unclear formulations, missing necessary explanatory comments, orthographical errors and missing options at single or multiple choice questions. Subsequently, the questionnaire was adapted according to the feedback.

Target group As the invitation to participate in the survey was sent to the members of the BMÖ the target group were Austrian companies, mainly industrial companies and to a lesser extend service companies. The target group includes large corporations that are listed in Austria's prime index ATX as well as SMEs from all over Austria.

3.3.2 Survey design

As suggested by Srnka and Koeszegi [101] the output of the qualitative analysis process of interviews can be used as a starting point for the survey development for empirical surveys as shown in section 3.3.1 on page 77. All propositions or hypothesis that have been developed from the qualitative content analysis have been validated with regards to their relevance towards answering the research question. In many cases, it will not be possible to validate each and every proposition, as the time it takes to participate in the survey must be limited. In order to validate the propositions, a question type must be assigned to each proposition.

In case of a combined qualitative-quantitative study, the questions are developed based on the propositions that are derived from the qualitative content analysis. Additionally, there are questions added that are not derived from the qualitative study but added in order to better segment results.

With regards to answering options, open and closed questions can be distinguished. While open question do not restrict the interviewee from expressing her or his opinion, closed questions force the interviewee to choose the best option or options from the available alternatives. Therefore, the use of close questions requires the researcher to find comprehensive answering alternatives which is difficult to assure and requires substantial pre-work[62]. While there are numerous possible ways of designing closed questions, only the most important should be explained a little bit more detailed:

- Open questions:
  Open question allow the interviewee to enter any type of answer to the question. There are no restrictions with regards to the content that is entered into the respective field.

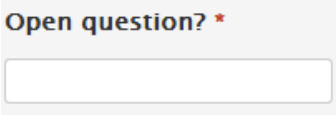

Figure 3.6: Example for a open question

- Single choice questions:
  Single choice questions only allow the survey participants to choose one of the presented options. Similarly to multiple choice questions, single choice questions only allow the survey participant to choose between pre-defined options and are therefore closed questions.

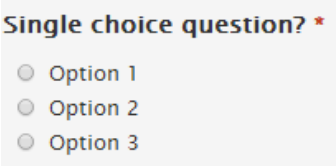

Figure 3.7: Example for a single choice question

- Multiple choice questions:
  Multiple choice questions allow the survey participants to choose one or more of the presented alternatives. As the alternatives for answering the question are predefined by the survey designer, multiple-choice questions are closed questions.

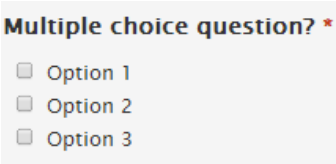

Figure 3.8: Example for a multiple choice question

- Likert scale questions:
  A Likert scale allows the survey participants to rate a statement. Likert scales normally provide five options whereby the last option is the opposite of the first option. The alternatives in between constitute the continuum in between the two extreme options. The third option normally constitutes the ”neutral” option. It is possible to label only the two extreme options (for example ”totally agree” and ”totally disagree”) or to label all options (for example ”totally agree”, ”agree”, ”neither agree nor disagree”, ”disagree” and ”totally disagree”) (compare Krosnick [62]). As Likert scale type questions do not allow the survey participants to express their own view but forces them to choose a predefined answer, they can also be categorized as closed questions type.

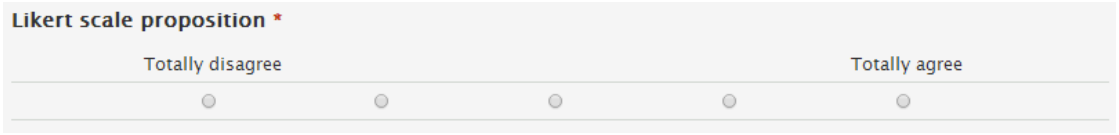

Figure 3.9: Example for a Likert question with only extreme options labelled

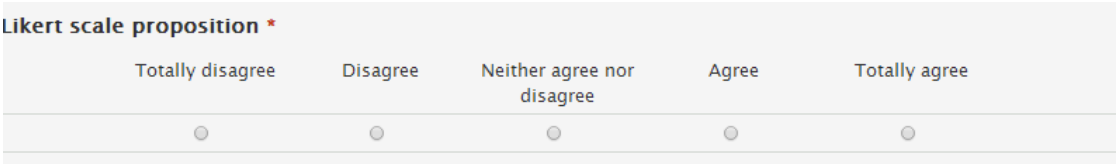

Figure 3.10: Example for a Likert question with all options labelled

- Likert scale batteries:
  Likert scale batteries are a number of Likert scale questions that use the same type of scale and are bundled together to make answering them more efficient.

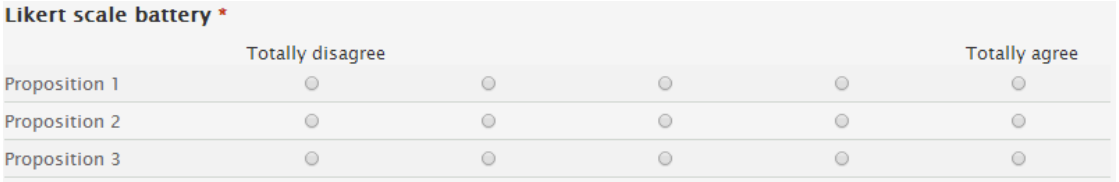

Figure 3.11: Example for a Likert question battery

- Semi-open questions:
  Semi-open questions are a combination of open and closed questions. Semi-open questions can be designed in multiple ways, the most common option is to add an additional field to Likert batteries of multiple choice questions that allows the survey taker to add his own comments.

Figure 3.12: Example for a Likert question battery containing an additional open response field

3.3.3 Survey analysis

The survey was analyzed in three steps: The first part is dedicated to describing the sample and distinguishes between data concerning the participating persons and data regarding the companies of the participants. The second part focusses on describing the actual results and the third part analyzes relations between the data set and certain characteristics of the sample. However, regarding company specific information only company size and supplier dependency are used for finding differences and concerning personal information participants age and education are used.

Due to open inputs the result set was not clear in every field. Therefore, minor adoptions were made to make the dataset processable. The changes were made directly in the source file , to be able to process the data as described in the next section.

Range The dataset consisted of answers given as ranges, like ”60-100” million Euro purchasing volume responsibility. These ranges were transformed to the mean of the given range. The result for the example was, therefore, changed to ”80”.

Greater than The dataset consisted of answers saying greater than a number (e.g. ”>30” year purchasing experience). These answers were changed to the given number. The example was transformed to ”30”.

Percentages The dataset finally consisted also of percentage answers. These were given for the last question group, namely gender. The answers were transformed to absolute numbers using the initial company profile given by the participants with the same employee numbers as asked in the gender questions. Answers like ”50%” to the question ”women in the purchasing function”, were multiplied with the total number of employees in the purchasing function.

In order to find an efficient approach how to display expected changes of the importance of factors that have been evaluated regarding their current and future importance, the following method has been used:

There have been 5 step Likert scales used with 3 being the neutral choice. The following percentage values have been assigned to the respective Likert scales for comparing expected

future developments:

Table 3.15: Likert scale percentage assignments

Likert scale	1	2	3	4	5
Percentage value	-100%	-50%	0%	+50%	+100%

In order to calculate the expected growth or reduction of the future importance, a linear relationship as suggested in 3.15 has been used. First, the mean of the expected growth or reduction has been calculated. In the second step the corresponding percentage value has been calculated.

CHAPTER 4

Results

The results of the survey will be displayed in three sections: The first section will be dedicated to describing the statistical sample. The description includes data about the participants (age, educational background, role etc.) as well as information about the organizations the study participants work for (sourcing markets, revenue, purchasing volume, employees etc.). The second part describes the actual results of the study whereby the answers of the questions will be analyzed. The third section will be dedicated to describing and analyzing relations between different data. These relations will be evaluated with regards to differences concerning certain characteristics of the survey participants (age, education) as well as concerning characteristics of the participating companies (size, supplier dependency).

4.1 Sample description

The invitation to participate in the survey was sent to approximately 1200 possible candidates from approximately 800 different companies.
The initial feedback consisted of 60 completed and 25 aborted attempts.

As suggested above, the participating persons and companies will be described separately. The sample included answers from 60 persons and the dataset indicates that none of them are part of the same organization (however it has to be recognized that this cannot be proved).
While the majority of the participants are leading a purchasing department of a SME, there is still a big diversity in the sample that can be considered representative for the Austrian industry. However, it has to be recognized, that the participants in the sample might be a bit biased, as all of the participating organizations are part of the BMÖ and can therefore be considered to having at least recognized the relevance of industrial purchasing.

4.1.1 Participating persons

As indicated in figure 4.1 the majority of the survey participants is in the age group between 30 years and 60 years with a peak in the group between 50 years and 55 years. This is quite unsurprising as the majority of the participants has a leading role in the procurement function. The median age is 45.5 years and average 45.95 years. The standard deviation of participant's age is 8.0 years. Therefore, age distribution can be considered to be quite balanced.

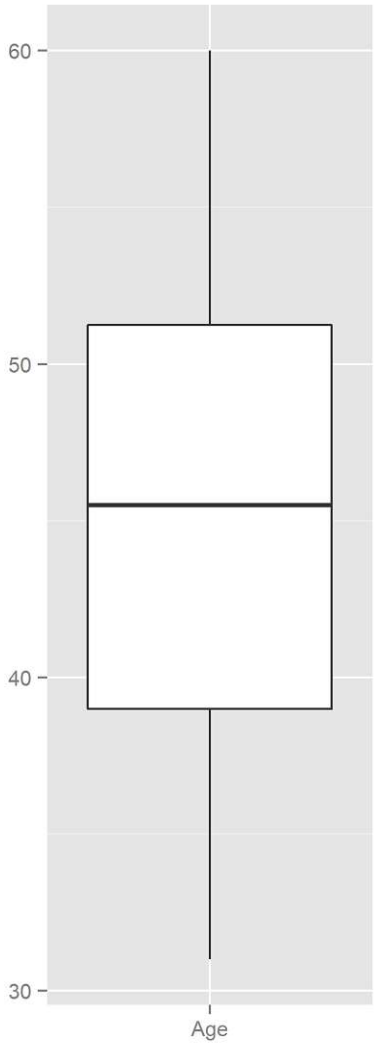

Figure 4.1: Age distribution of survey participants

Figure 4.2 on the next page shows the education distribution of the survey participants. While 45% have a university degree of some kind and about 13% have graduated from a univer-

sity of applied sciences, approximately 37% have graduated from a high-school (AHS, HAK, HTL). Only 5% have a finished commercial apprenticeship.
It is unsurprising that the majority of university graduates have a commercial degree (approximately two thirds) while the the distribution is about even for high-school graduates.

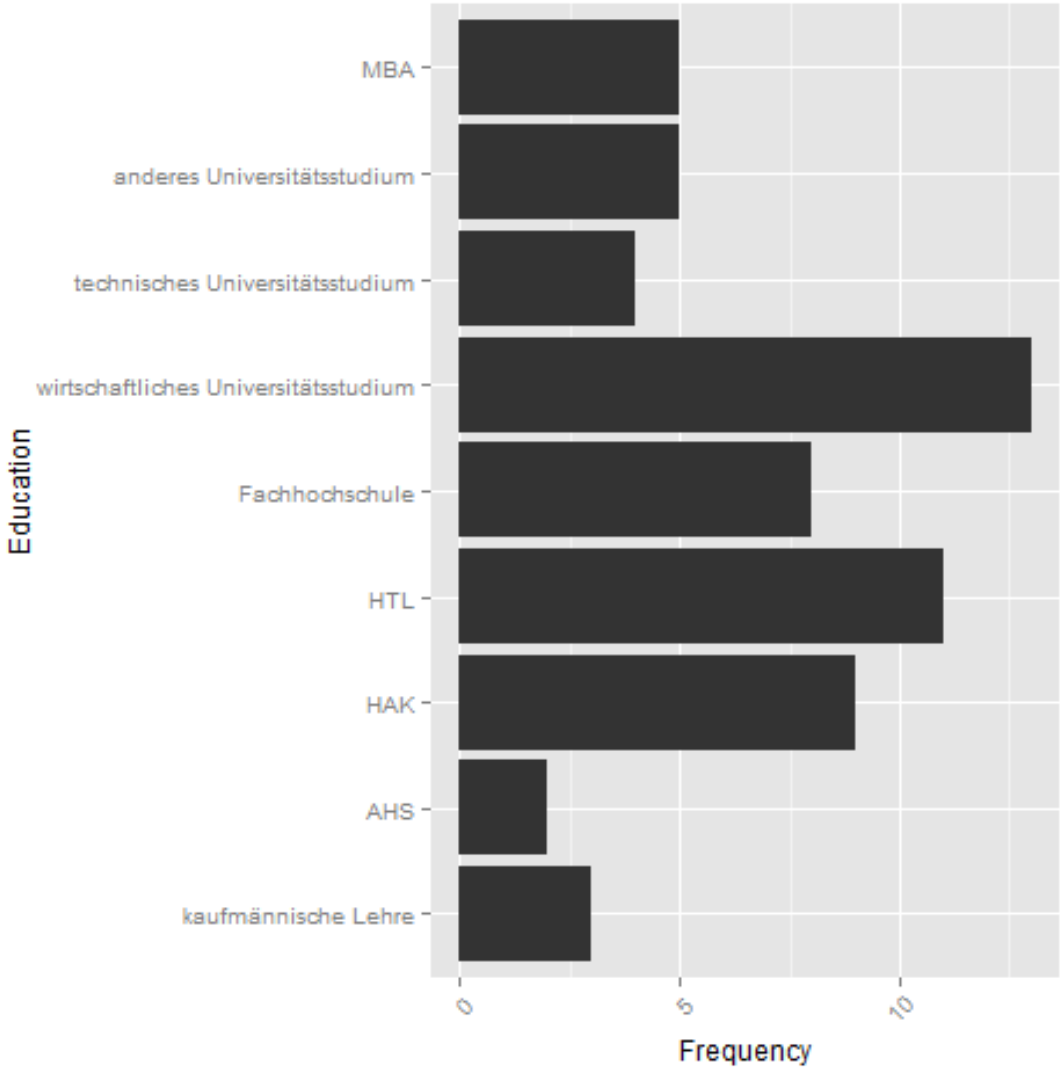

Figure 4.2: Education of survey participants

As expected, the majority of the survey participants are male. This can be explained partly due to the different quantity of man and women working in procurement organizations and partly due to the fact that most survey participants have leading role within the procurement organiza-

tion where the number of women can be expected to be even lower than in roles in the operative of strategic purchasing. Approximately 92% of survey takers are men and 8% women.

The large majority of participants are heading the purchasing department of their respective companies (approximately 78% of participants). About 8% have a leadership position within the purchasing department such as category manager or head of the strategic or operative purchasing, 5% consider themselves to be part of senior management. The rest of the participants are either employees in the purchasing department or other functional areas.

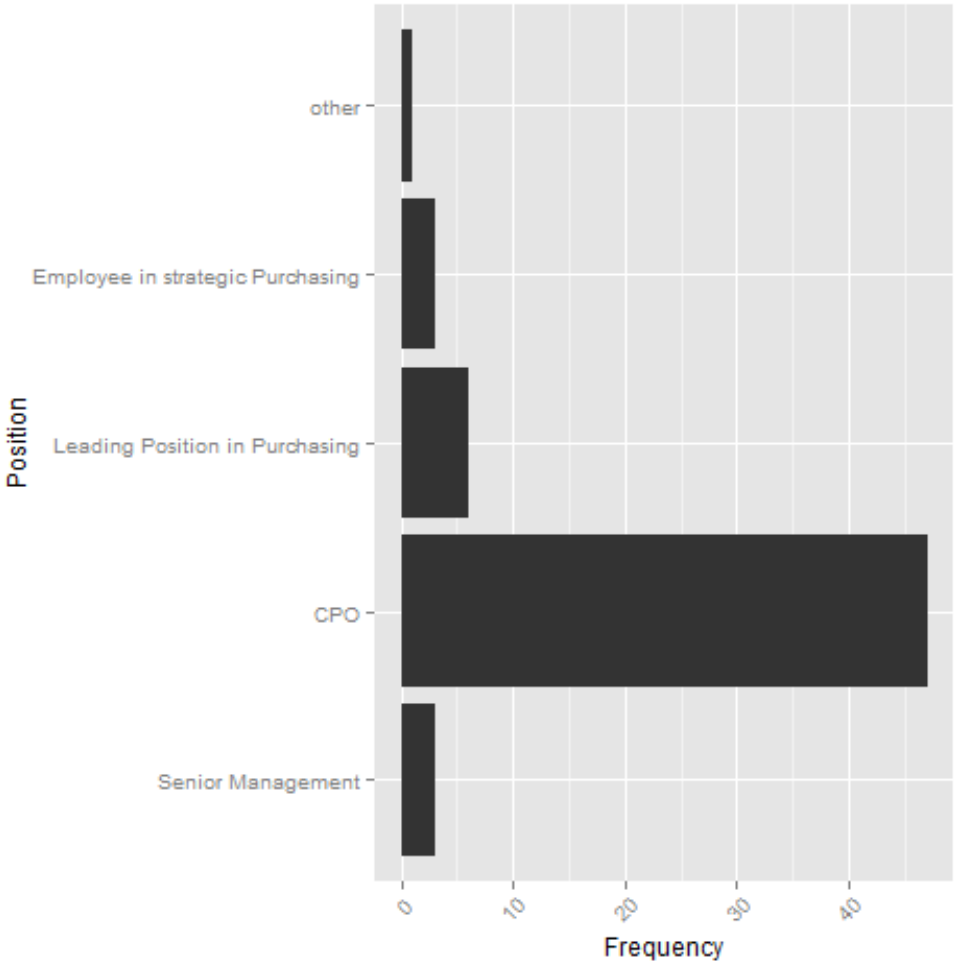

Figure 4.3: Position distribution of survey participants

The vast majority of participants has a purchasing experience between 5 years and 25 years. Only about 7% have a purchasing experience of less than 5 years and approximately 17% have more than 25 years of purchasing experience.
The median of the purchasing experience of all survey participants is 16.5 years and the average is 16.6 years. The standard deviation is 8.4 years.

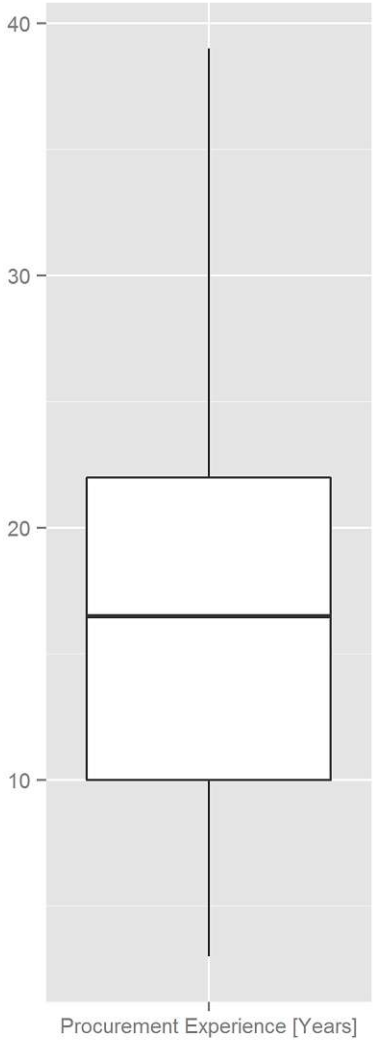

Figure 4.4: Purchasing experience of survey participants

45% of participants have a purchasing volume responsibility of less than EUR 50 million. Approximately 28% are responsible for managing a purchasing volume between EUR 50 million and EUR 100 million. About 18% manage a volume between EUR 100 million and EUR 250 million. Only about 8% are responsible for a purchasing volume that exceeds EUR 250 million. The median purchasing volume responsibility is EUR 50 million, the average purchasing volume EUR 90.7 million. The standard deviation is EUR 100.3 million. Therefore, as shown in 4.12 on page 97 the purchasing volume responsibility of most participants is in a quite small range with a few outliers that are are responsible for volumes that significantly exceed the average.

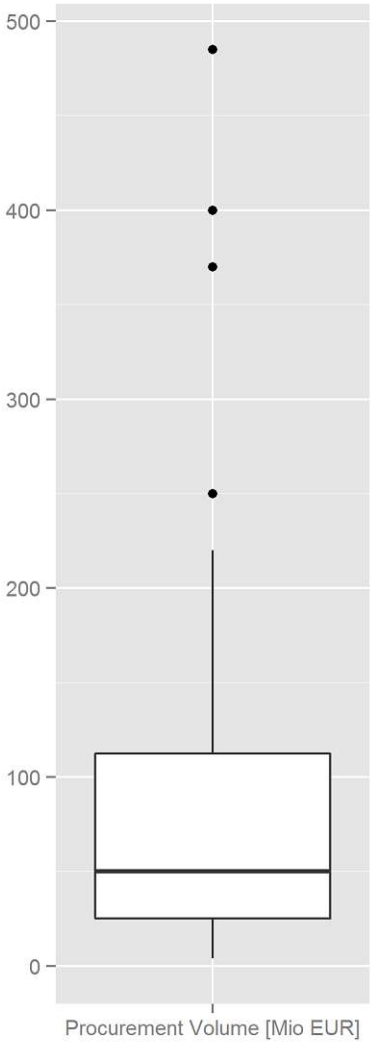

Figure 4.5: Purchasing volume responsibility of survey participants

4.1.2 Participating companies

Unfortunately, nearly 43% of all participants did not find an appropriate industry for their respective business. However, as there was multiple selection possible, a few of the participants who indicated that their respective company is active in an industry other than the suggested industries have chosen at least one of the suggested industries as well.
Nevertheless, the industry selection of the participants does not allow to draw any meaningful conclusion beside the one that the companies of the survey participants are active in a wide range of different industries.

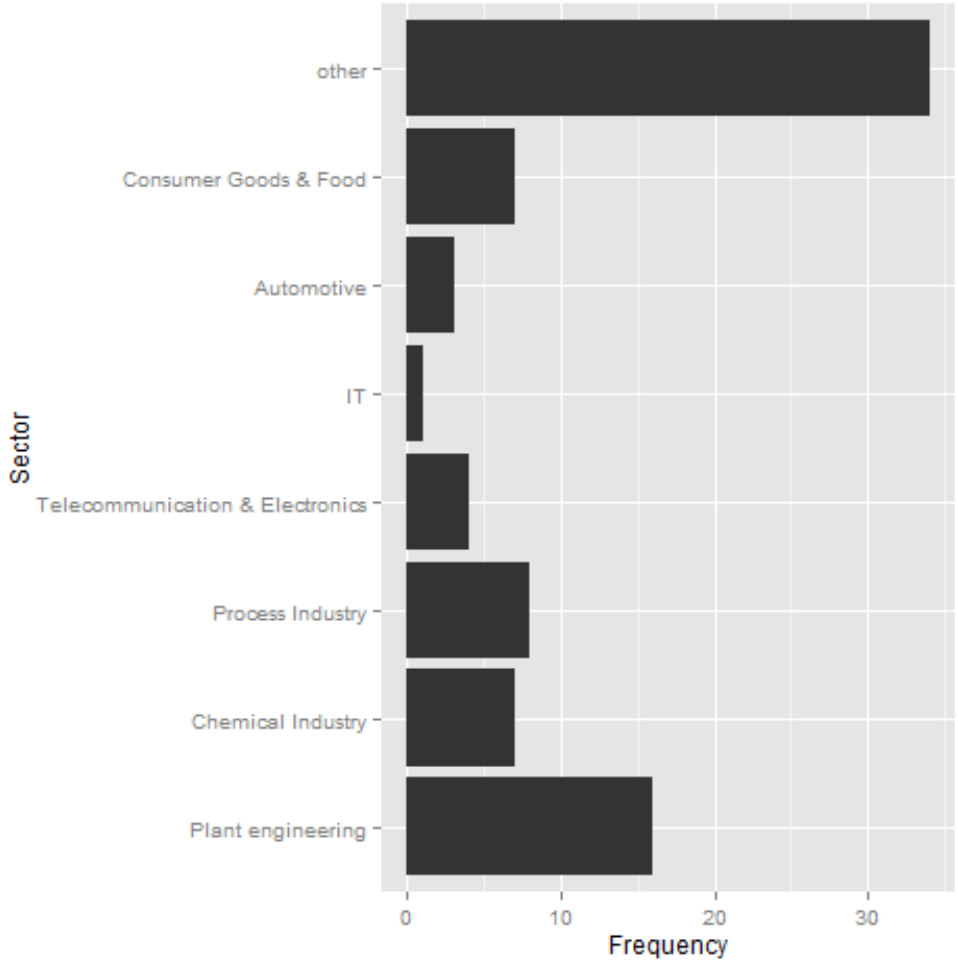

Figure 4.6: Industry distribution of participating companies

Participating companies are active in all types of manufacturing and in services. While mass production and process production, small and medium series production and single and single piece production are the most important types, the distribution is still balanced.

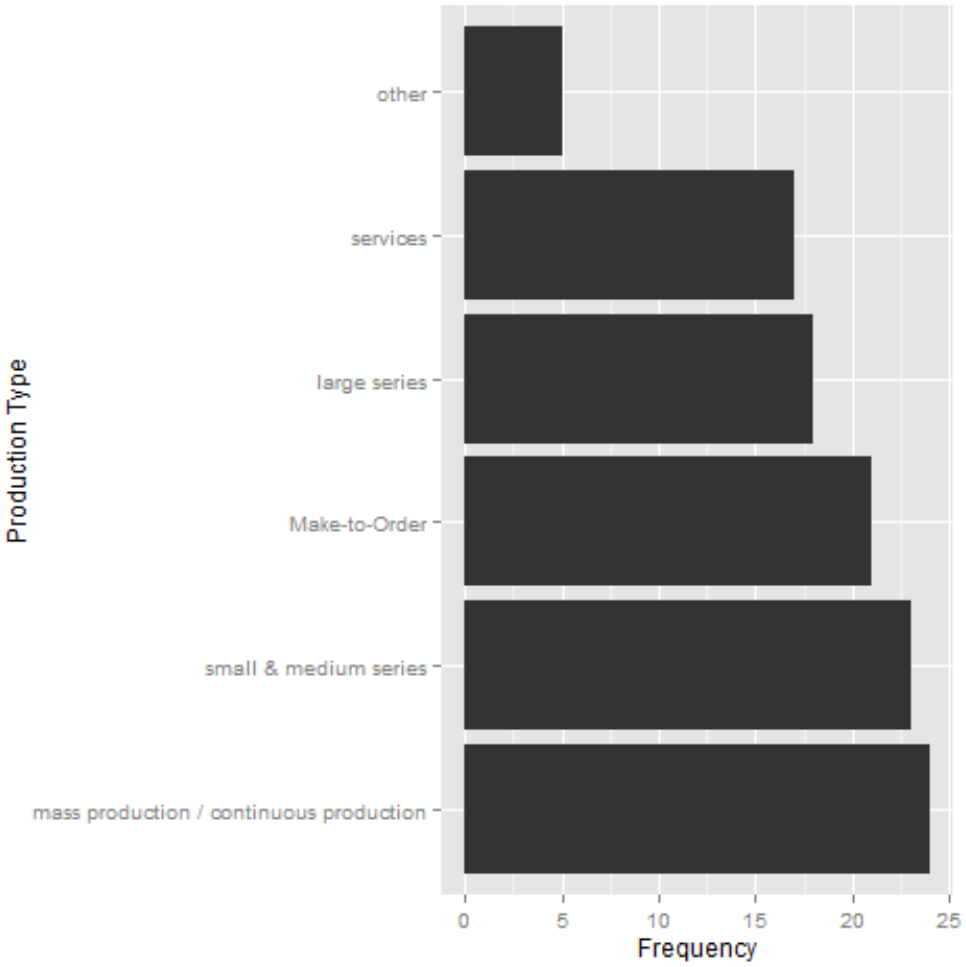

Figure 4.7: Prevailing type of manufacturing

It seems that most of the participating companies' purchasing departments are responsible for buying all required goods. However, indirect materials seem to be a category where some purchasing departments are not involved.
Quite surprisingly, services and CAPEX goods are bought by nearly all purchasing departments as well.

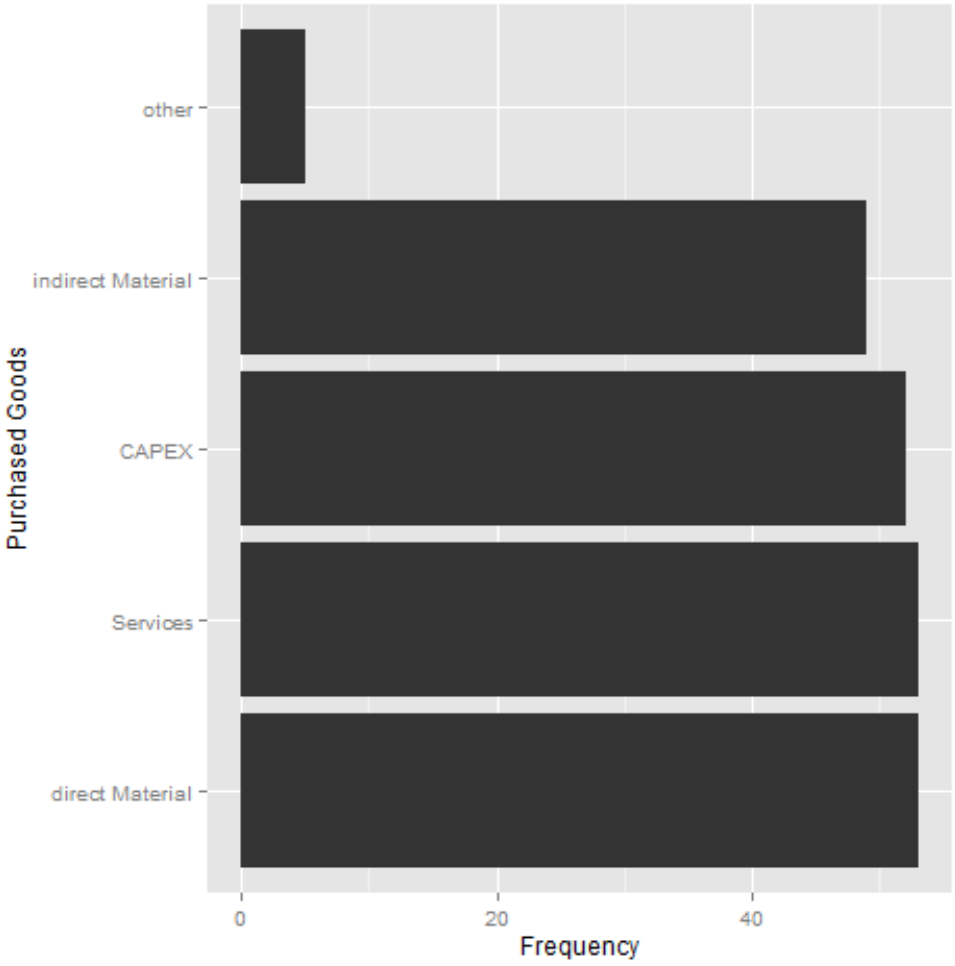

Figure 4.8: Purchased goods

While the vast majority of participating companies have less than 1000 employees (approximately 63%), only 15% of the companies have more than 4000 employees. Quite a significant share of the companies have less than 250 employees (approximately 18%) or between 250 and 500 employees (approximately 22%). This represents the nature of the Austrian economy quite well as the Austrian economy is characterized by SMEs.
The median number of employees of participating companies is 662.2 and the average 2183.3. The standard deviation is 3790.5. Once again, the figures show that the number of employees of most participating companies is in a quite small range with a few outliers heavily exceeding the average.

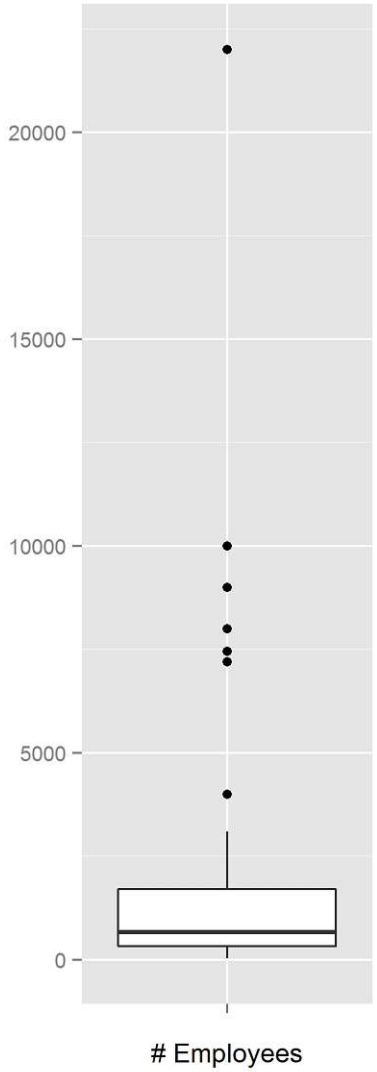

Figure 4.9: Total employees distribution participating companies

Figure 4.10 shows the distribution of purchasing personnel in the participating companies. The number of professionals that work in operative sourcing exceeds the number of strategic buying personnel in most cases. The median number of purchasing professionals is 10, while the median number of operative buyer is 6.5 and of strategic buyers 3. Similarly to the revenue and purchasing volume figure, the average numbers are significantly higher than the mean and the standard deviation is relatively high due to a few outliers.

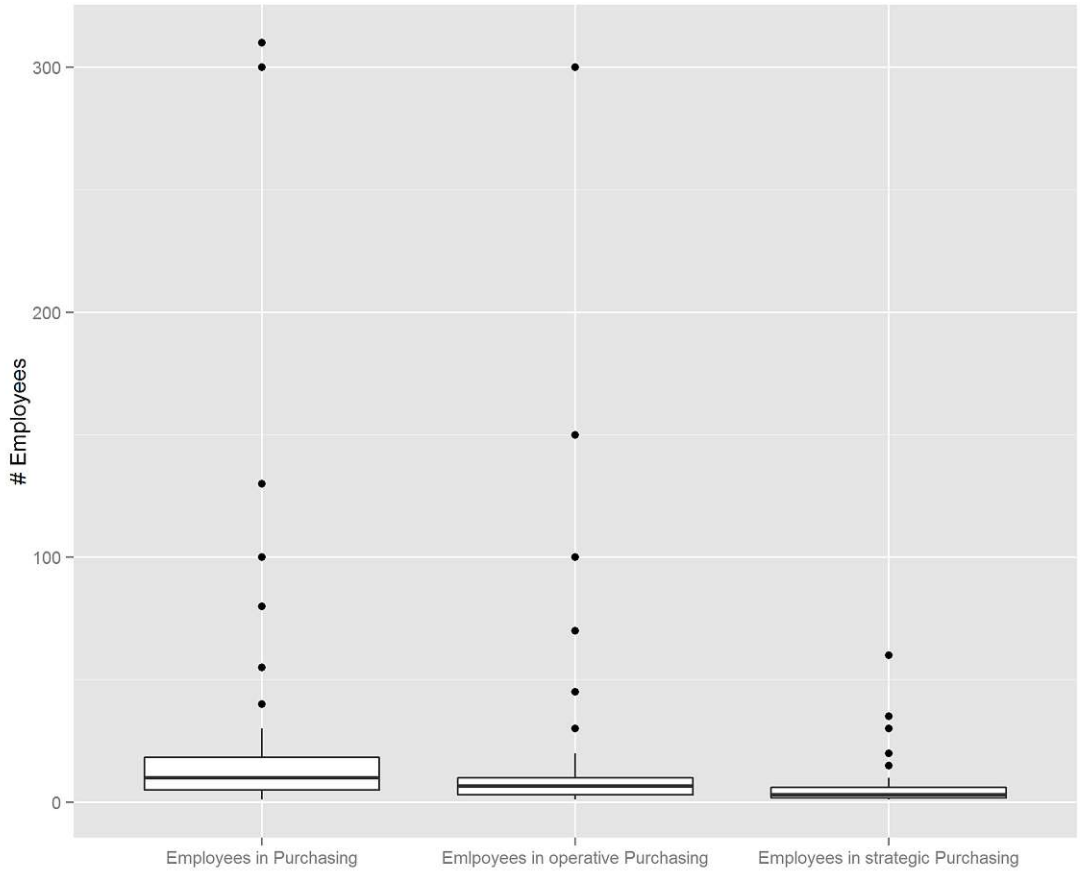

Figure 4.10: Procurement employees distribution of participating companies

The ratio between the number of operative and strategic purchasing personnel is an interesting indicator for the complexity and segmentation of the purchasing activities and can be used for drawing conclusions whether or to what extend a company's purchasing organization can be considered to be strategic.
While the median of the ratio is 0.5, meaning there are double as many operative buyers as strategic buyers, there are quite a few outlier where the strategic aspect seems to be what most purchasing employees focus on.

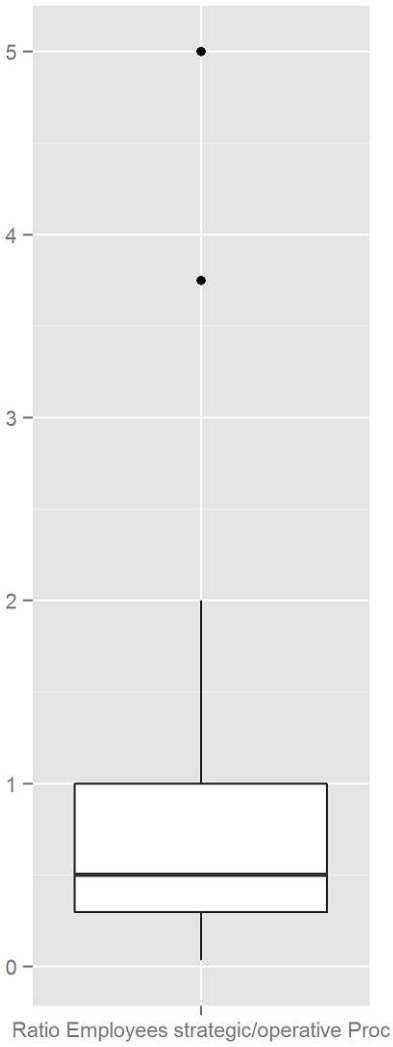

Figure 4.11: Ratio between total employees and procurement employees

The majority of participating companies have a purchasing volume below EUR 200 million. There are quite a few outliers, the maximum purchasing volume is approximately EUR 2.5 billion.
However, as indicate in 4.1.2 on page 94 the majority of companies that have participated are SMEs.
The median purchasing volume is EUR 75 million, the average is EUR 243.1 million and the standard deviation is 454.5 million.

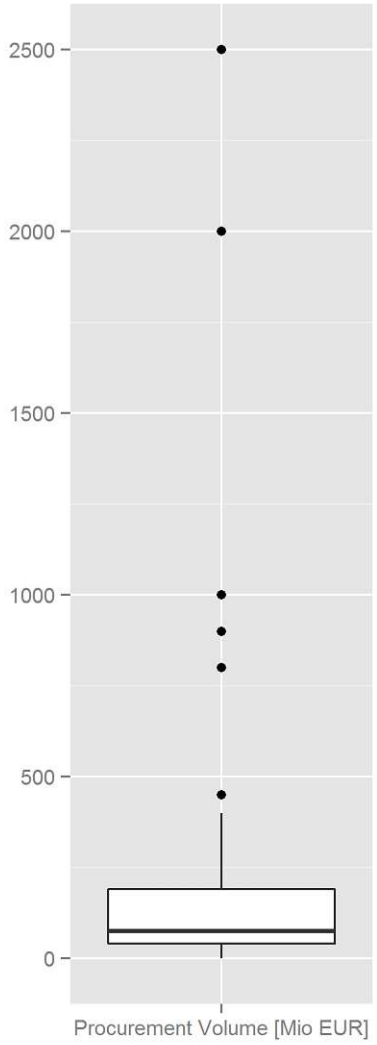

Figure 4.12: Procurement volume distribution of participating companies

The revenue ranges from EUR single digit million number to more than EUR 5 billion. However, as expected, the majority of participating companies feature a revenue of well below EUR 500 million. The median revenue is EUR 150 million, the average is EUR 625.3 million and the standard deviation of participating companies' revenues is EUR 1044.4 million. Once again, the figures show that most participating companies are relatively small with a few very large outliers.

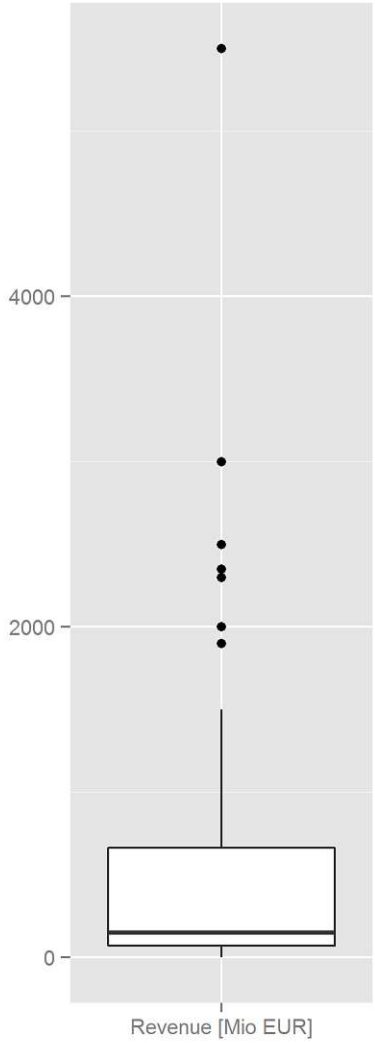

Figure 4.13: Revenue distribution of participating companies

The ratio between purchasing volume and revenue is a very important indicator for the significance of the purchasing function with regards increasing profitability.
The median of the ratio is approximately 50%, the average is nearly 47% and the standard deviation is approximately 19%.

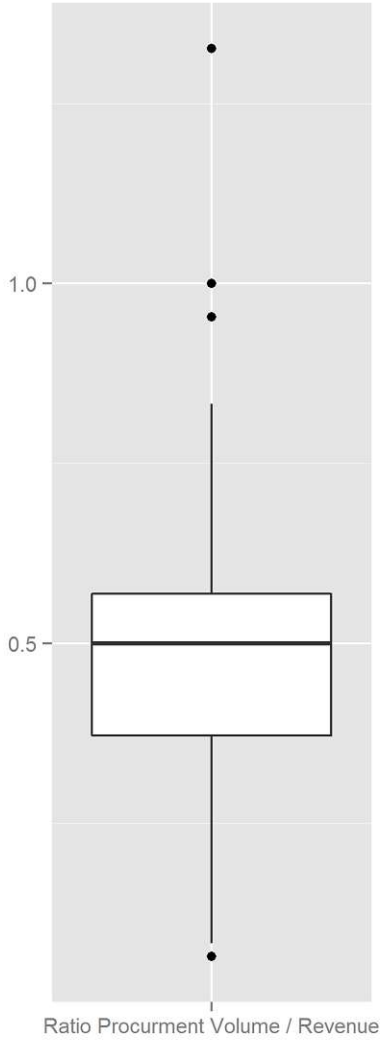

Figure 4.14: Ratio between procurement volume and revenue of participating companies

Sourcing markets have been pre-segmented in Austria, other industry countries, emerging markets and developing countries. The median score is highest in Austria with other industrial countries being second, emerging markets being third and developing countries being fourth.

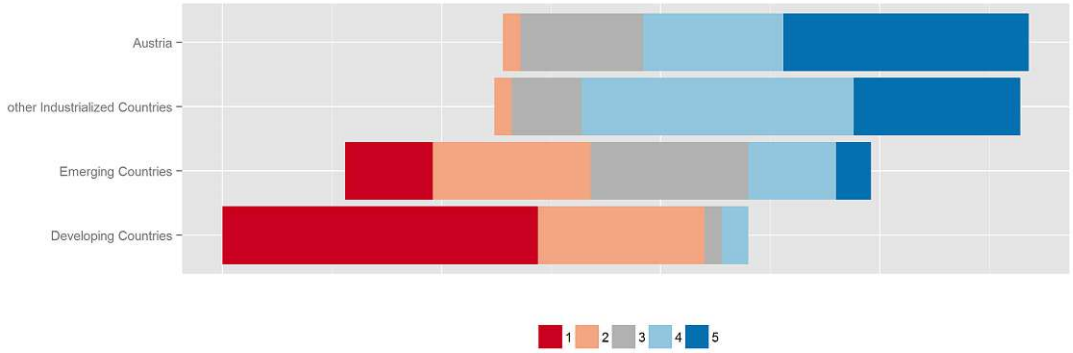

Figure 4.15: Main purchasing markets of participating companies

Participants were asked whether they consider supplier know-how and supplier innovation important for their company.
The median score on the suggested five point Likert-scale was higher for the question about the importance of supplier know-how, however the difference is too small to be considered significant.

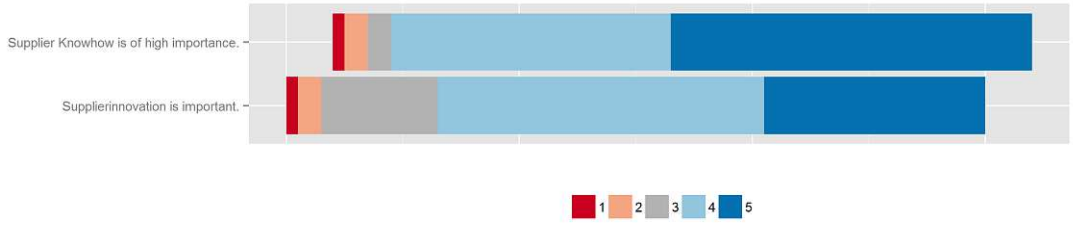

Figure 4.16: Perceived importance of supplier innovation and know-how

4.2 Results

4.2.1 Tasks

A total of 14 different tasks has been evaluated with regards to their current perceived importance and the expected future development. The 5-point Likert scale for the current situation started with ”not important” and ended with ”very important” while the 5-point Likert scale for the perceived development of the importance started with ”strongly decreasing” and ended with ”strongly increasing”. A list of all tasks and the respective mean scores can be found in table 4.1 on page 105.

While the mean ratings range from 2.12 to 3.90 it is also important to point out that the lowest rating (”FOREX balancing”) is an outlier that is rated significantly lower than the second least important tasks (”Participating in R&D processes rated 3.25 on average). Furthermore, it is interesting to point out that there is no clear pattern how operative and strategic tasks are rated. While the highest rated tasks (”Order processing” at 3.90) is operative, some strategic tasks are highly rated as well (such as ”Supplier search” or ”Supplier evaluation”). Moreover, it might be of importance to underline that some of the tasks are rated more controversially as others: While the mean standard deviation over all tasks is exactly 1.00, some tasks have significantly higher standard deviations (such as ”Participating in RFQ” with 1.31 or ”Order processing” with 1.13) and are therefore seen more controversially.

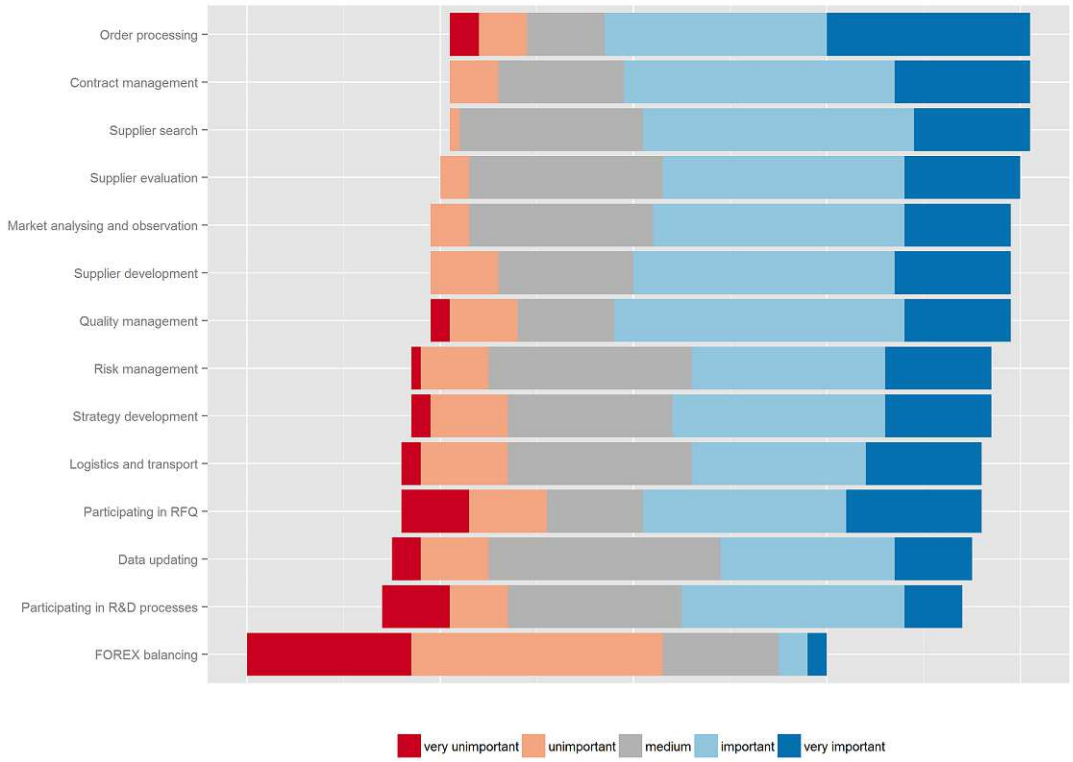

Figure 4.17: Importance of purchasing tasks

There are three tasks that have a mean rating that is significantly less than the average: The perceived development of the importance of ”Order processing” is not expected to grow at all. In fact, it is the only one of the 14 tasks in question that is expected to loose importance in the next 10 years.
Furthermore, ”Data updating” has a relatively low rating and is seen quite controversial as is has the highest mean standard deviation with regards to its perceived future development score (0.80 points). ”FOREX balancing” not only has the lowest ranking with regards to the current importance, but participants also expect it to only slightly rise in importance in the next ten years.

Furthermore, it is interesting to point out that no participant has rated the future development of ”Supplier development”,”Risk management” or ”Market analysing and observation” with less than 2 points. The same is true for ”Participating in RFQ” and ”Contract management” although these two tasks have a significantly lower mean rating.

The highest rated tasks with regards to future importance are all of a strategic nature: ”Supplier development”, ”Risk management” and ”Logistics and transport” as well as ”Strategy de-

velopment" or "Participating in R&D processes" are all rated highly and therefore give evidence for the hypothesis that purchasing is an emerging strategic function.

The mean rating of 3.60 means that participants expect tasks to rise moderately in importance and complexity. Therefore, the requirements and challenges for purchasing employees can be expected to grow as well.

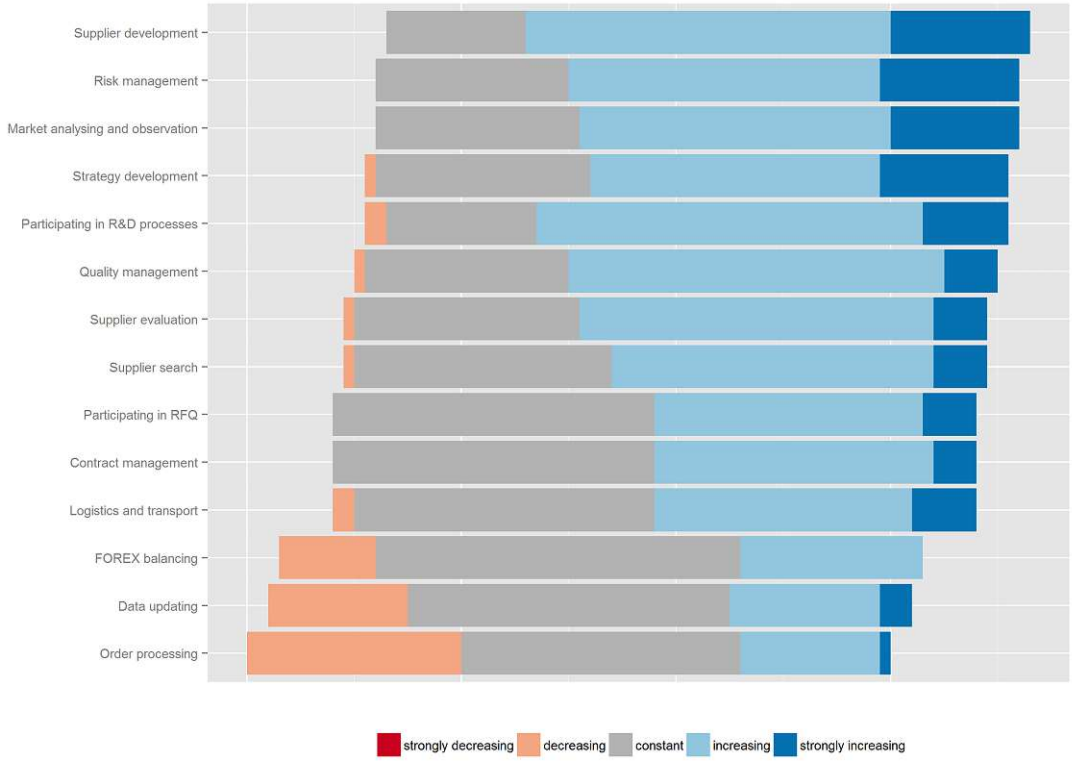

Figure 4.18: Importance of purchasing tasks in ten years

Figure 4.19 shows the current mean importance and the respective future development. There seems to be a pattern that operative tasks are currently relatively highly rated but not expected to grow significantly in importance while many of the strategic tasks are rated relatively modestly but expected to grow fast.
Furthermore, it is obvious that ”FOREX balancing” is a outlier and does not need to be considered for any future research effort.

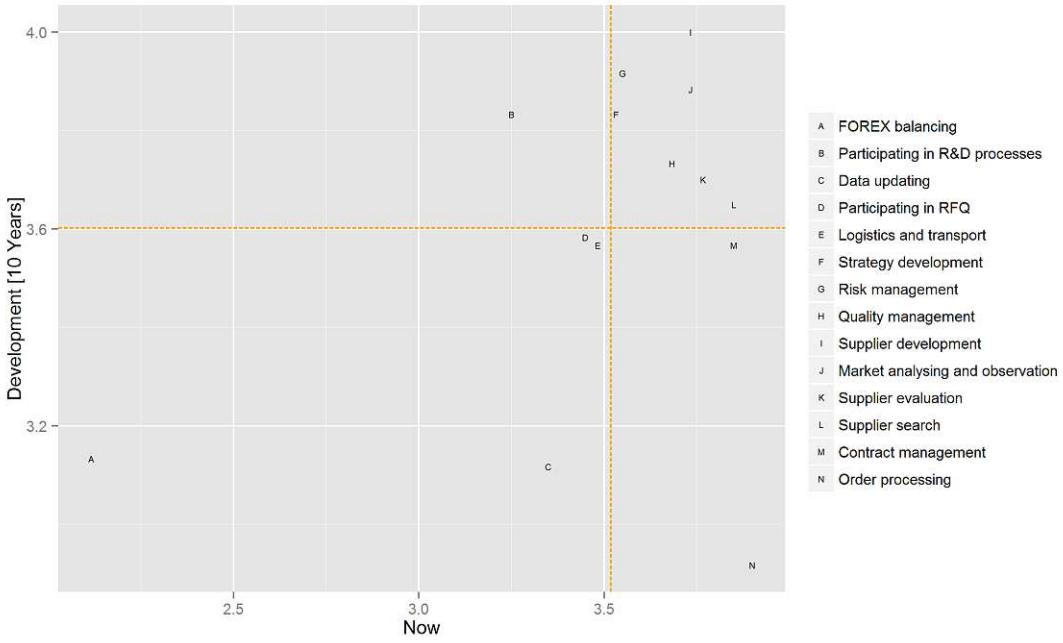

Figure 4.19: Importance of purchasing tasks: Today and future development

All tasks have been categorized with regards to whether they are more of a operational or strategic nature as shown in table 4.1 on the next page. The categorization has been conducted according to the definitions in section 2.1 on page 4.
As shown in table 4.1 on the next page, operative tasks are ranked higher than strategic tasks with regards to their current importance while strategic tasks are ranked higher with regards to their expected future importance.

Table 4.1: Importance of purchasing tasks

Task / mean importance	*today*	*in ten years*	*development*	*type*
Supplier development	3.73	4.00	**+50%**	strategic
Risk management	3.55	3.92	**+46%**	strategic
Market analysing and observation	3.73	3.88	**+44%**	strategic
Strategy development	3.53	3.83	**+42%**	strategic
Participating in R&D processes	3.25	3.83	**+42%**	strategic
Quality management	3.68	3.73	**+37%**	operational
Supplier evaluation	3.77	3.70	**+35%**	strategic
Supplier search	3.85	3.65	**+33%**	strategic
Participating in RFQ	3.45	3.58	**+29%**	operational
Contract management	3.85	3.57	**+28%**	operational
Logistics and transport	3.48	3.57	**+28%**	operational
FOREX balancing	2.12	3.13	**+7%**	strategic
Data updating	3.35	3.12	**+6%**	operational
Order processing	3.90	2.92	**-4%**	operational
Mean	3.52	3.60	**+30%**	
Standard deviation	1.00	0.69		
Mean strategic tasks	3.44	3.74	**+37%**	
Mean operative tasks	3.61	3.41	**+21%**	

It is quite interesting to point out that the current importance of the tasks is seen significantly more controversial than their future development: While the mean of the standard deviation of the current perceived importance is 1.00 point, the expected development features a mean standard deviation of only 0.69 points.

Furthermore, the future perceived importance scores of the five highest ranked tasks (”Supplier development”, ”Risk management”, ”Market analysing and observation”, ”Participating in R&D processes” and ”Strategy development”) can all be considered to be part of strategic purchasing activities while two of the three lowest ranked tasks are of a operative nature (”Order processing” and ”Data updating”) and only one is a strategic task (”FOREX balancing”). The other tasks all have future perceived importance rankings that are in a quite small range (between 3.57 and 3.73).

The cooperation with the ”Manufacturing/Production” department is unsurprisingly seen to be the most important with ”Finance and Controlling” and ”Quality management” being second and third respectively.
Quite interestingly, the cooperation with ”R&D” is only the fourth most important function. However, it has to be recognized that the standard deviation of ”R&D” is significantly higher than the one of the other departments. Therefore, it can be concluded that the cooperation with the R&D department is either of a relatively high or of a relatively low importance, possibly depending on the type of industry and the structure of the value-chain.
The ”Legal department” and the ”Marketing and Sales” department are rated relatively low and also feature a higher rate of neutral ratings.

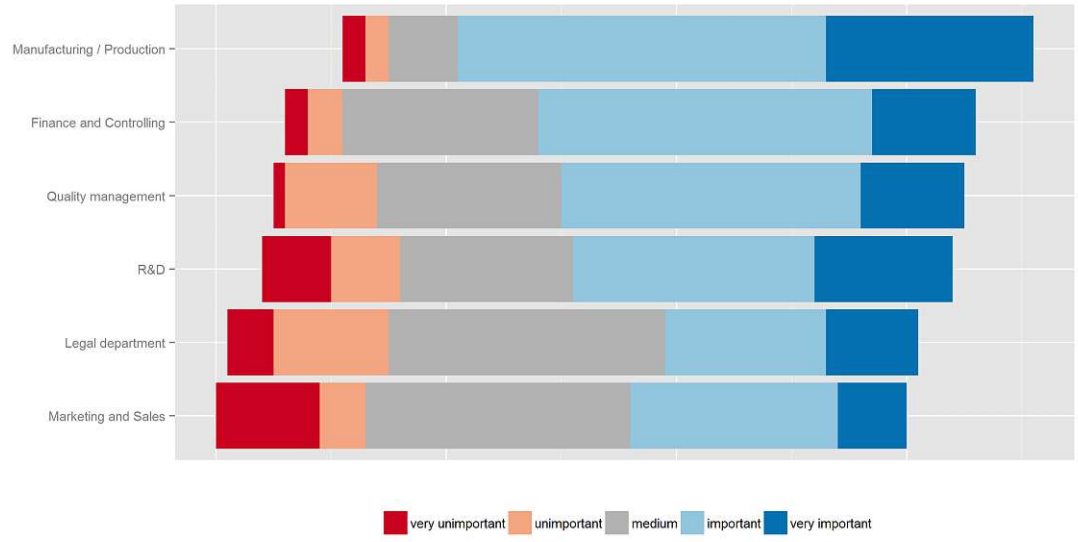

Figure 4.20: Importance of cooperation between purchasing and other departments

While the current importance of the cooperation with the R&D department is seen a bit controversial, the future development seems to be clear: The importance is rising. The same is true for the cooperation with ”Quality management”. ”Marketing and Sales” can be expected to grow modestly just as the cooperation with the other departments.
Similarly to the perceived future development of the importance of purchasing tasks, the perceived future development of the importance of the cooperation with other departments is being seen far less controversial than the their respective current importance with the standard deviation of the future development being only slightly more than half the one of the current importance (0.54 vs. 1.04 compare table 4.2 on page 108).
Furthermore, it is necessary to point out that the share of neutral answers is significantly higher than the neutral ratings of the current situation and also higher than the one displayed in figure 4.18 on page 103 which means that relatively many participants have no opinion to this issue

are think that the situation will stay as it currently is.

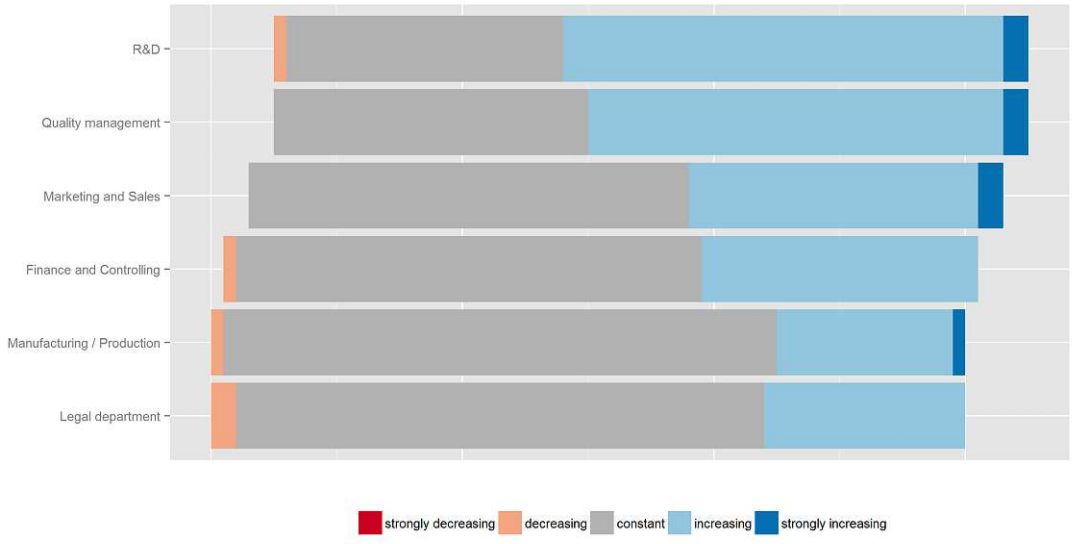

Figure 4.21: Development of the importance of cooperation between purchasing and other departments

Figure 4.22 on the following page shows the current importance and the respective future expected importance of the cooperation with various functional areas.
What is interesting is the relatively modest spread in the rating of the current importance (0.90 points difference in mean) and even more significant in the rating of the future importance (only 0.40 difference between the mean of the highest and the lowest rated functional area).
However, there can be no doubt that the cooperation with the R&D department gets significantly more important, just as the cooperation with ”Quality management”. This also gives evidence to a trend that was already visible during the evaluation of the interviews (compare chapter 3.2.2 on page 72).
To conclude this paragraph, it should be underlined, that the number of neutral answers in this chapter might also point to the fact that the question with whom to cooperate might not one of utmost importance for the participants as the question with whom to cooperate is normally not answered deliberately but is more the result of a complex process.

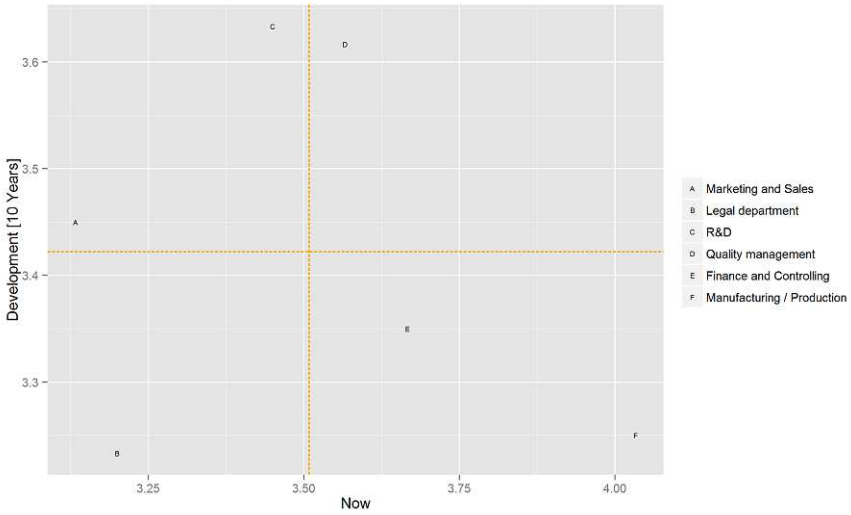

Figure 4.22: Importance of cooperation between purchasing and other departments

Table 4.2: Relevance of other functional areas

Department / mean importance	*today*	*in ten years*	*development*
R&D	3.45	3.63	**+32%**
Quality management	3.57	3.62	**+31%**
Marketing and Sales	3.13	3.45	**+23%**
Finance and Controlling	3.67	3.35	**+18%**
Manufacturing / Production	4.03	3.25	**+13%**
Legal department	3.20	3.23	**+12%**
Mean	3.51	3.42	**+21%**
Standard deviation	1.04	0.54	

While the majority of participants state that purchasing is involved in the process of RFQ creation, only around half of the participants' companies involve purchasing in the concept creation process, the prototype development or the transition to series production. However, about 60% of participants claim to be involved in the definition of product specifications. However, it has to be recognized that the product development process can be conducted in many ways and will be quite different for different products. For example, plant engineering where every product is unique does not allow to produce prototypes. However, the participation in product development phases like specifications definition or the creation of the concept that will be applicable to nearly all companies and product development processes is relatively low with around 50%.

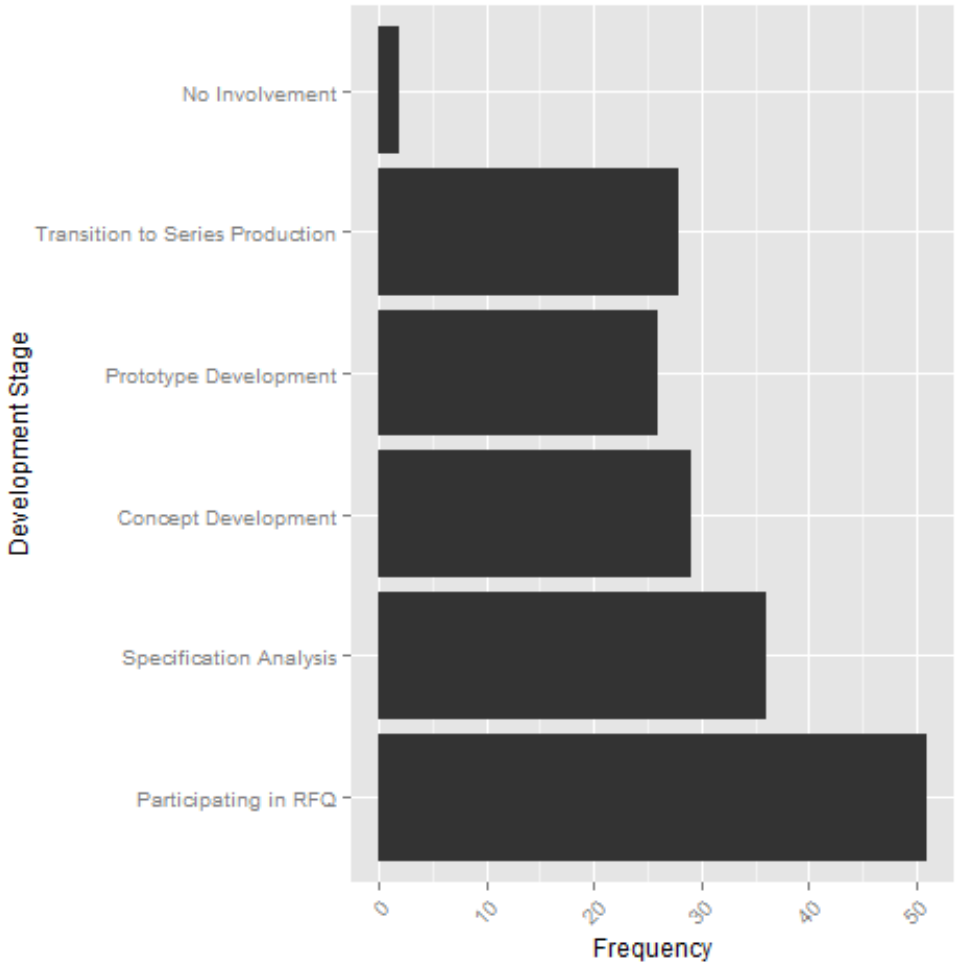

Figure 4.23: Integration of the purchasing function in R&D processes

Purchasing integration in R&D processes can be expected to grow in the next ten years. Especially the involvement in ”Concept development” and Specification Analysis” can be expected to grow significantly.

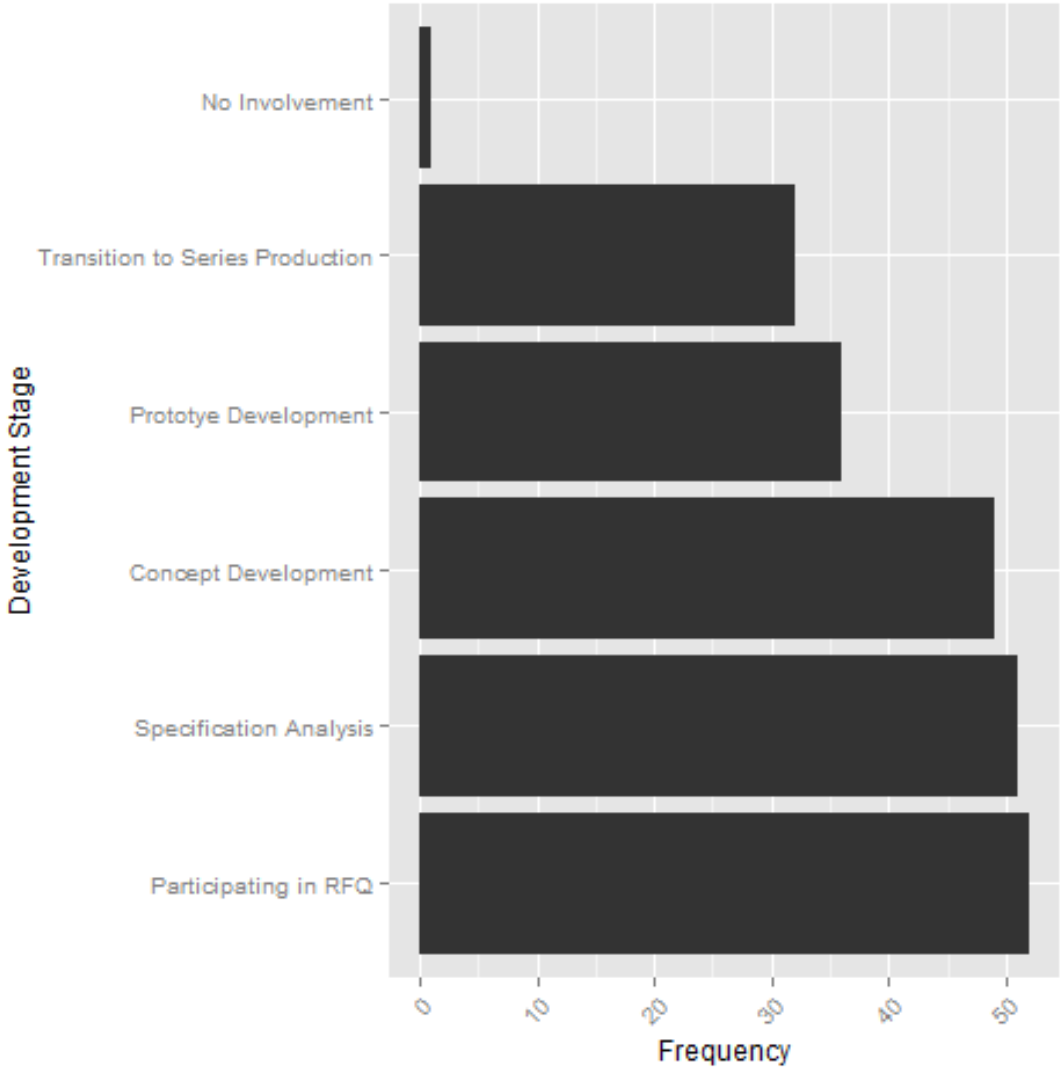

Figure 4.24: Organizational aspects of purchasing integration in R&D

This question focused particularly on the organizational integration of the purchasing department into the R&D process. While the vast majority of participants says participating in R&D processes is as subtask of a purchasing employee, only about 20% of the participants say that there are a separate project purchasers in their company and about 15% have a liaison position that is dedicated to handling purchasing related issues in the R&D department.

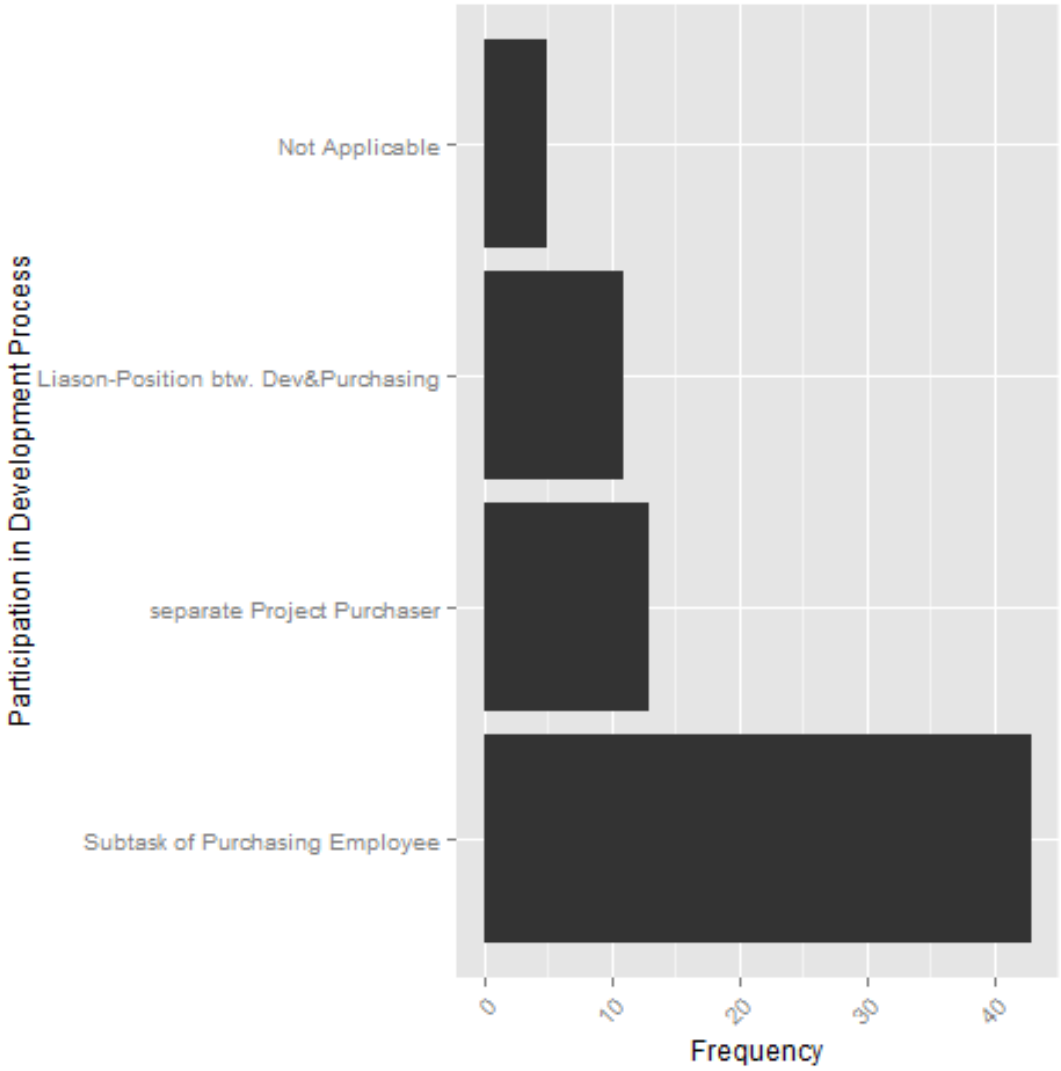

Figure 4.25: Organizational aspects of purchasing integration in R&D

This question aimed to evaluate the main responsibility of the purchasing function in the R&D process.
The cost aspect seems to be the most important factor with ”Establish Cost Awareness” being rated very high at 4.32.
Furthermore, it seems to be an essential task to play a mediation role between the supplier and the internal departments that have contact with the supplier (such as R&D or manufacturing). Quite interestingly, no participant perceives the task of mediation between internal and external stakeholder to be of lower than average importance.
Supplier innovation and external know-how also seems to be of relevance, however a few participants do not perceive it to be important. The same is true for the task of ensuring spare-part availability.

Furthermore, it is very interesting to see that the majority of participants do not consider the integration of purchasing in R&D processes to be formalized. This is a point that has already been evaluated qualitatively and gives evidence to the hypothesis that the involvement of the purchasing department in R&D related issues often depends on personal ties between purchasing and R&D personnel.This point is for sure an issue that needs to be addressed in the future as a formalized, clearly defined way of integration is a necessary requirement for achieving truly advanced purchasing organizations that can contribute to a companies strategic goals.

However, in general, beside the way purchasing is integrated in R&D and importance of spare part availability, the answers are not too controversial and the picture is quite clear: Purchasing has to be involved in R&D processes and has to take responsibility, especially for issues related to cost reduction and supplier cooperation.

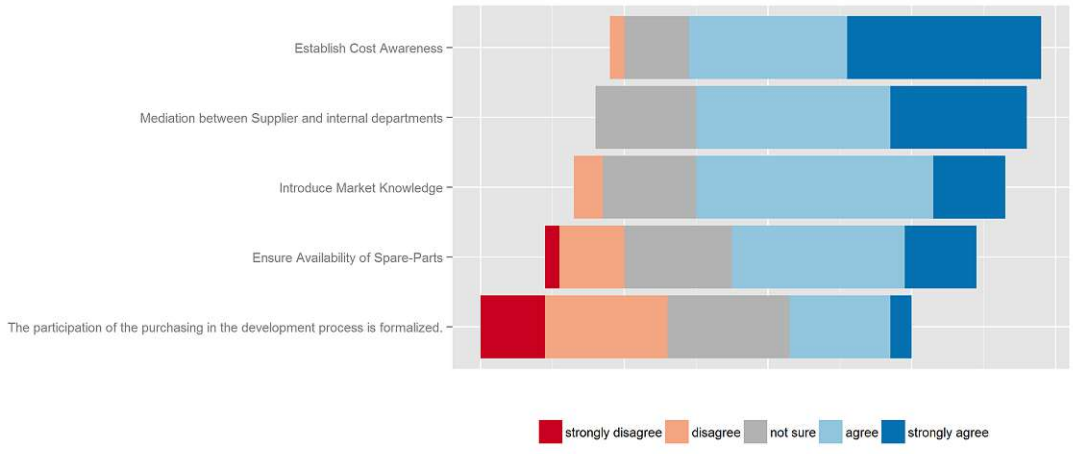

Figure 4.26: Tasks of the purchasing function in the R&D process

4.2.2 Organisation of the purchasing function

The vast majority of participants indicate that the CPO in their respective organization is positioned on the first level below the management board. Only about 5% of CPOs seem to be positioned in the management board and about 15% are positioned at least 2 hierarchical levels below the board. Therefore, the trend that has already been visible in the qualitative study proves right: Most CPOs are positioned one level below the board with a minority further down the hierarchy and a small portion of CPOs in the board.

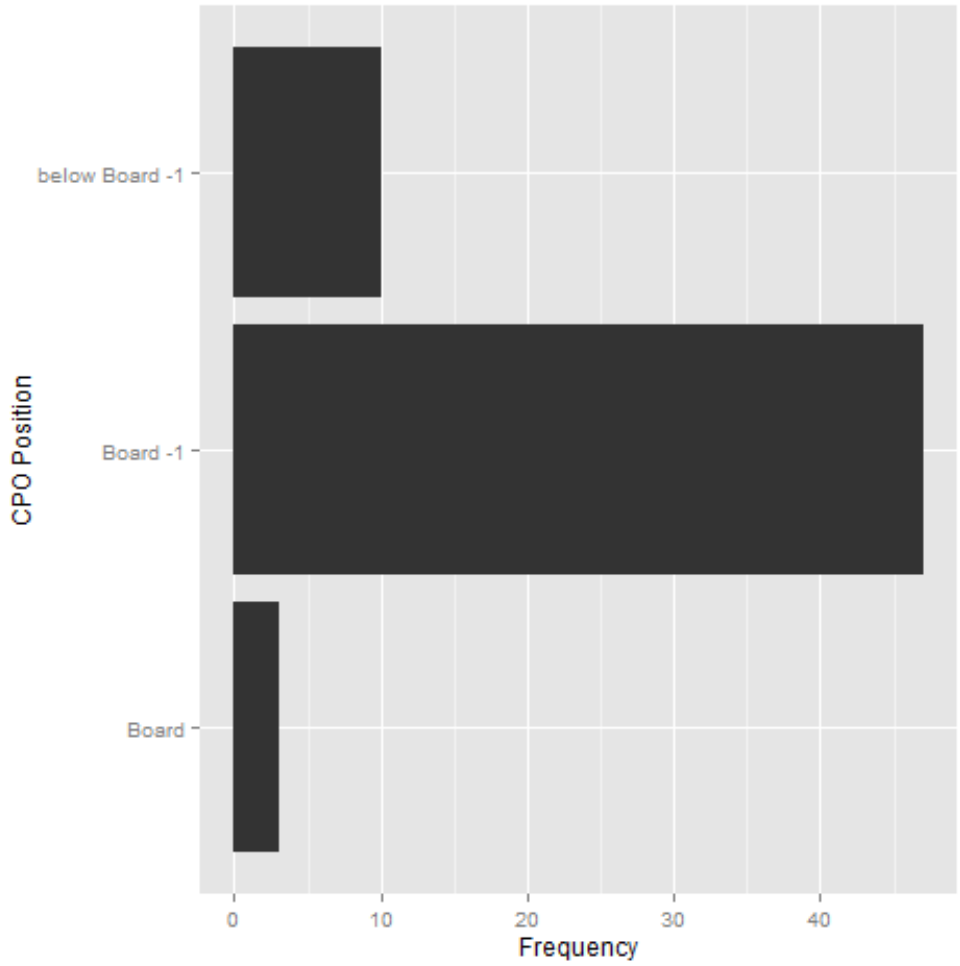

Figure 4.27: Position of the CPO today

While the number of participants that see the CPO one level below the board is similar to the number in figure 4.27 on the preceding page, there is a considerable switch in the distribution between participants that see the CPO in the board and those that see the CPO more than one level below the board. Obviously, most participants feel that the role of the CPO is an emerging one.
However, it has to be recognized that the majority of participants is heading a purchasing department and can be considered to be CPO (even if the actual job title is a different one). Therefore, the possibility that participants are a bit biased about the significance of their own role has to be considered.

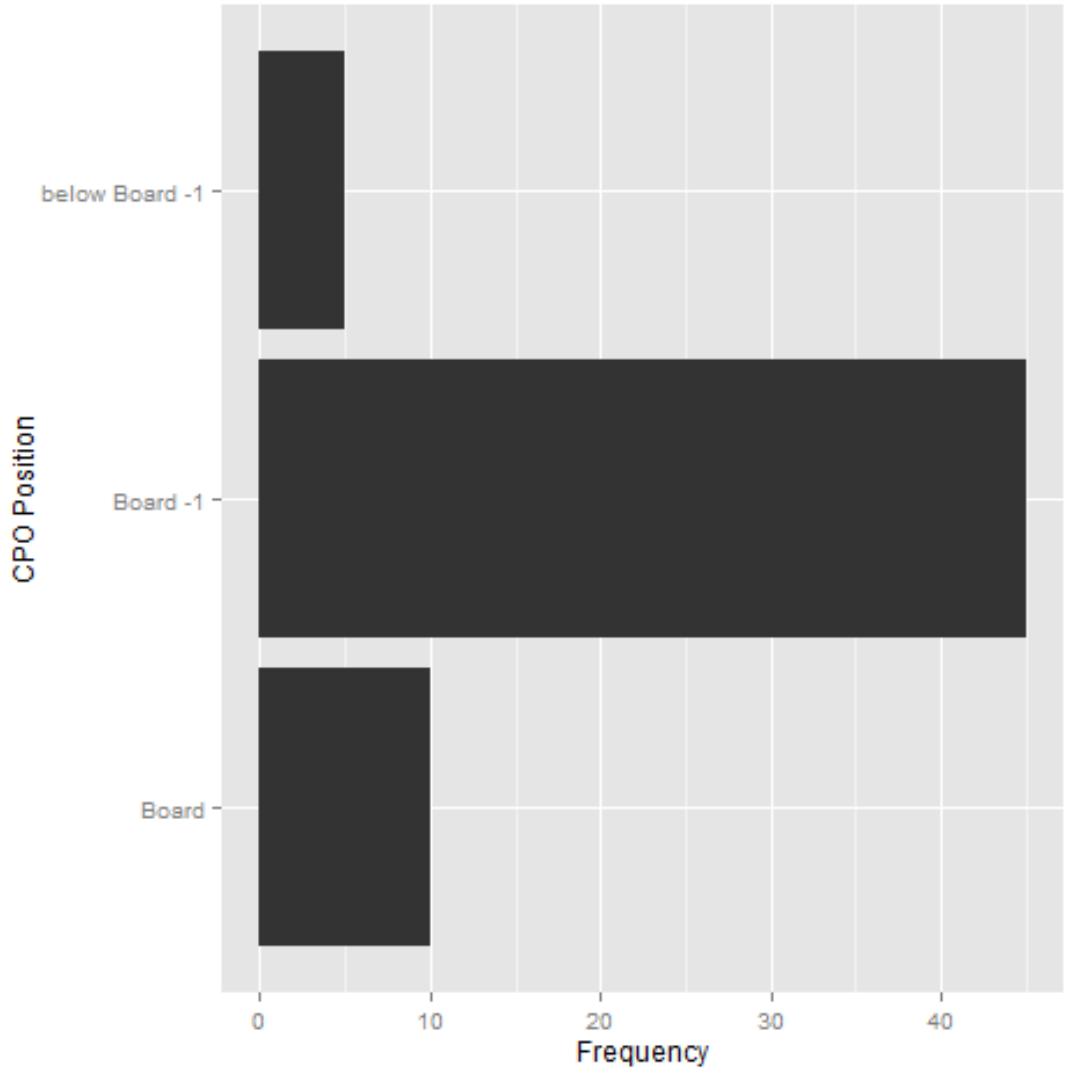

Figure 4.28: Position of the CPO in ten years

More than two thirds of participants indicate that the head of purchasing is responsible for other areas as well (such as SCM or logistics or material management for example). Furthermore, about one third indicated that the head of purchasing is the subordinated of another function's head (such as SCM, production etc.).

With regards to the general organizational design of the purchasing function, there is as expected a wide variety of different organizational structures.
This ranges from a material group / commodity based kind of organization (nearly 50%) over product group based organizations (approximately one third) via matrix organizations and divisional organizations.
However, as expected commodity based and matrix organizations that incorporate elements of a commodity based organization as well as a product based organization are the most popular forms of organization.

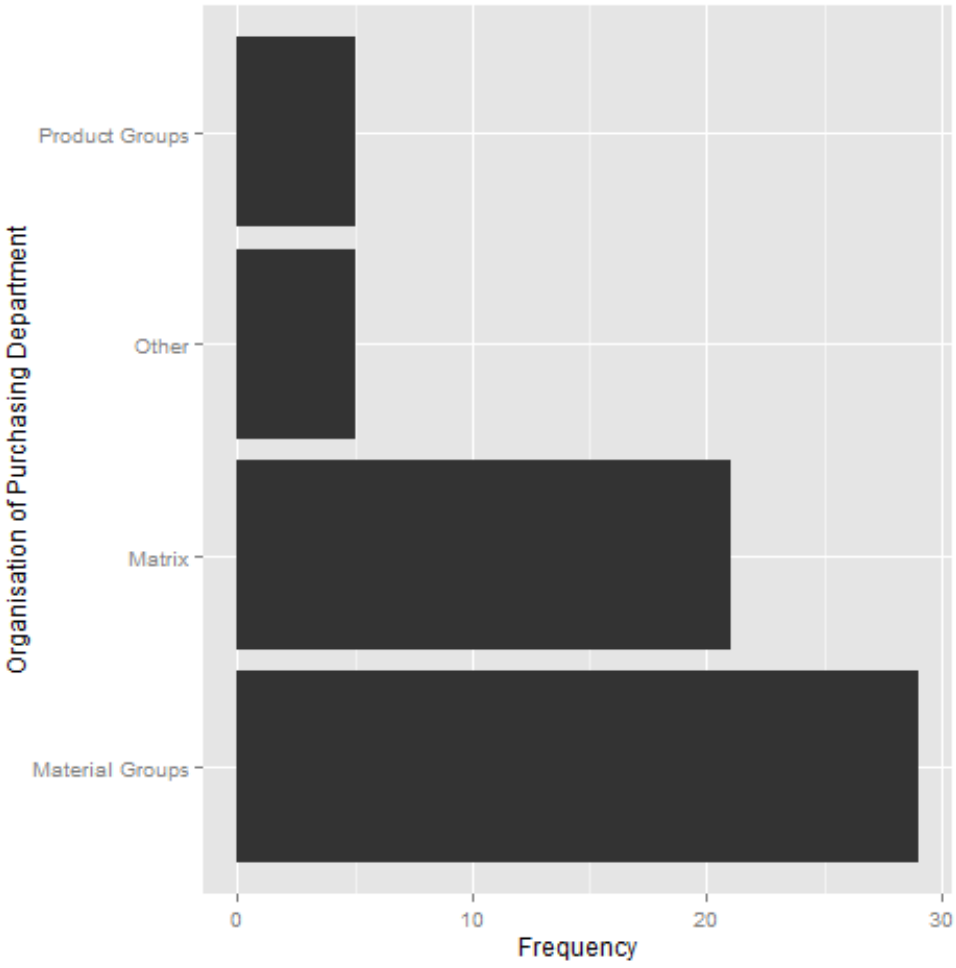

Figure 4.29: Organizational design of the purchasing function

There seems to be no undisputed trend in purchasing organization in the next ten years. While the lead buyer system is applied by approximately half of participant's companies, there is no strong evidence that this will change in the next years. The mean rating for the development of the lead buyer system is 3.43 meaning that participants expect it to slightly gain in importance. However, as for the current application of the lead buyer systems, the answers are quite controversial with standard distributions for the mean score of 1.33 for today's application and 1.17 for the future development respectively.

With regards to centralization and decentralization of the purchasing function, the following can be said: The mean rating for the centralization of the purchasing function is 3.95 which is relatively high. Furthermore, the ratings in the $4-5$ range (agree or strongly agree with the proposition that the purchasing function is centralized) outnumber the ratings in the $1-2$ range (strongly disagree or disagree) by far (43 compared to 3). Therefore, it can be reasoned that today's purchasing organizations are organized quite centrally. However, with regards to the future development there is no clear picture. While the mean rating for the proposition "Purchasing organizations will be more decentralized in ten years" is only 1.92 the rating for the opposite is quite low as well (3.13). Therefore, it can be reasoned that purchasing organizations will not change too much with regards to their level of centralization and if there will be change there is a good chance they will be more centralized. Decentralization seems not to play a major role.

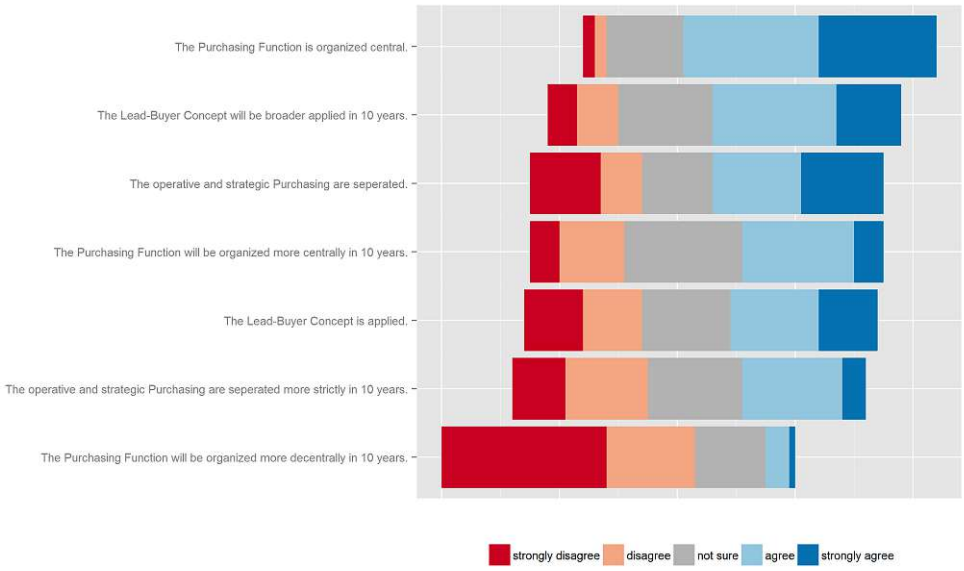

Figure 4.30: Trends in the organization of the purchasing function

With regards to the level of organizational separation between operative and strategic purchasing there seems to be a big spread between the experience of the survey participants as well:

While the number of neutral answers is relatively limited, the number of those who agree or disagree is relatively similar. Therefore, it seems not all companies have yet executed a ”modern” purchasing organization that clearly defines and separates operative and strategic responsibilities. The standard deviation of 1.45 clearly shows the level of diversity.
With regards to the future expectations of the separation the picture is not clear as well: While the mean score of 2.88 is nearly neutral, the standard deviation of 1.18 points is relatively high as well. Furthermore, the correlation between the current separation between operative and strategic purchasing and the expected future separation is virtually non-existent (-0.07). Therefore, there can be no statements made over the future development of the separation between operative and strategic purchasing.

Regarding the status of the purchasing function, it is once again necessary to emphasize that this question is subject to possible biased answers due to the structure of the sample. Purchasing professionals naturally tend to overestimate the significance of their own status and influence.
Nevertheless, the picture is relatively clear: The purchasing professionals seem to have the impression that their own function is neither more important than other functional areas nor is it less important.
With regards to the future development, participants see the future of the purchasing function quite bright: The mean score for the proposition that the purchasing function is growing in importance is 3.38. However, those agreeing outnumber those that do no agree by a ratio of nearly 3.5. This is a clear indication that purchasing professional expect their own function to gain importance.
When it comes to the way the success of the purchasing function is evaluated, monetary figures seem to play a more significant role than non-monetary indicators: The score of 3.38 for monetary indicators shows that this quite a common way to evaluate purchasing performance. Furthermore, only 12 participants or 20% indicate that there are no monetary purchasing performance indicators in their company. The mean for non-monetary performance indicators is only 2.57 and 28 participants or nearly 50% say that there are no non-monetary performance indicators in their companies.

Quite interestingly and contrary to the expectation that was developed through the literature study and the interviews, the future expectations for the performance indicators show no shift towards a less monetary based-approach. On the contrary, the participants do not believe that non-monetary indicators will be more important in the future (score of 2.57) while the mean for the future expectation of monetary indicators is significantly higher at (3.28). Therefore, it can be expected that hard financial savings will remain the most important way to evaluate purchasing performance in the future.

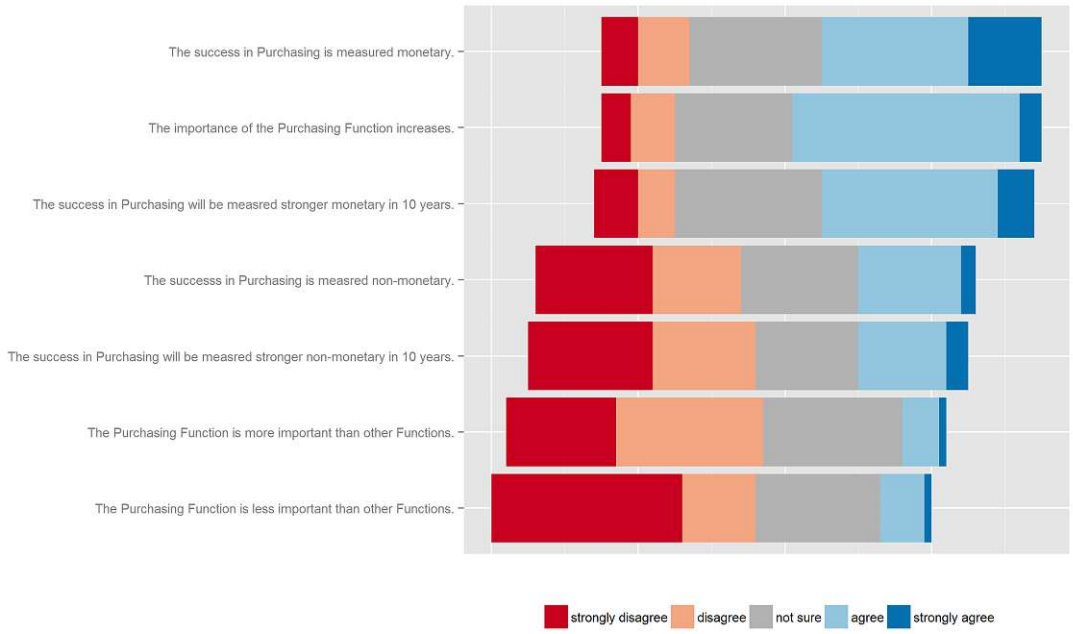

Figure 4.31: Status of the purchasing function

4.2.3 Education and skills of purchasing professionals

A high number of operative purchasing professionals currently have a commercial education either a commercial apprenticeship (”kaufmännische Lehre”) or a commercial high school (”HAK”). A substantially smaller group has a technical apprenticeship (”technische Lehre”), a normal high school degree (”AHS”) or a technical high school degree (”HTL”). Only a minority has a university degree (”Universitätstudium”), a degree of a university of applied sciences (”FH”) or a MBA. There are more employees that have a degree from a university of applied sciences than university graduates with a degree in business or in a technical major.

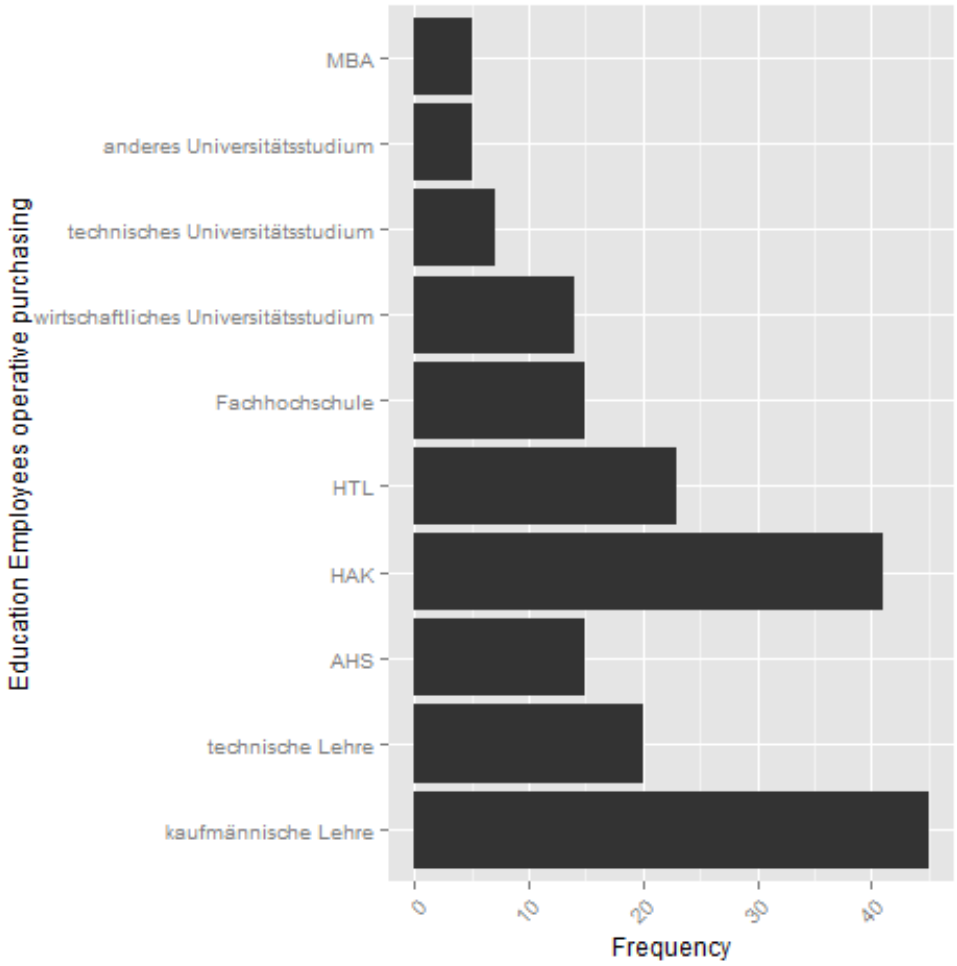

Figure 4.32: Current education of operational purchasing employees

Only a small minority of strategic purchasing employees have a apprenticeship or a normal high school degree. Approximately the same number of participants indicate that there are strategic buyer with a commercial high school degree, a technical high school degree, a university of applied sciences degree or a degree in business from a university. Strategic buyers with a technical university degree are substantially less common, as are MBAs or graduates from with a university degree other than in business or engineering.

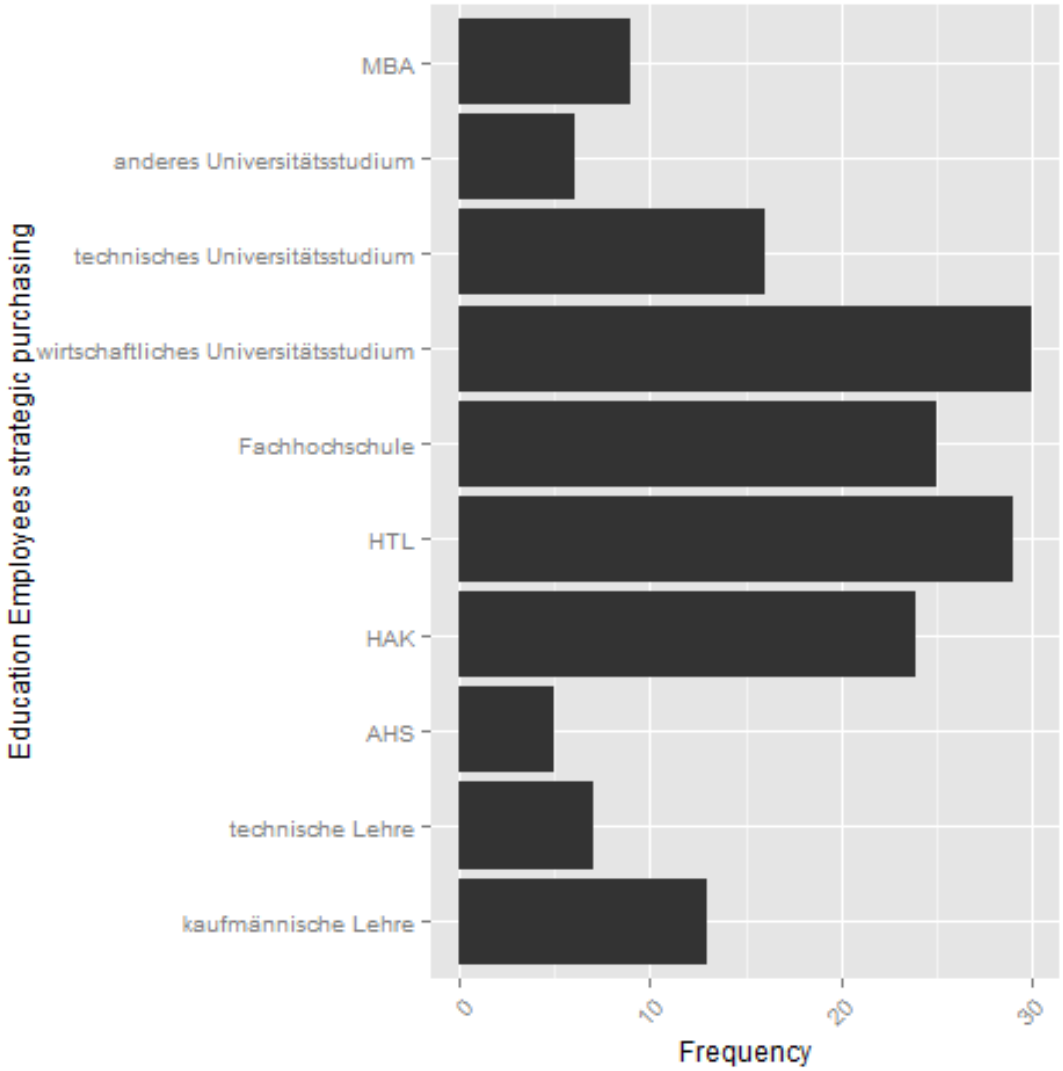

Figure 4.33: Current education of strategic purchasing employees

The plot in figure 4.34 clearly shows that strategic buyers tend to have a higher education than operative buyers. Especially apprenticeships, a normal high school degree or a commercial high school degree are significantly less common for strategic buyers. The contrary is true for technical high schools, degrees from universities of applied sciences and any university degree.

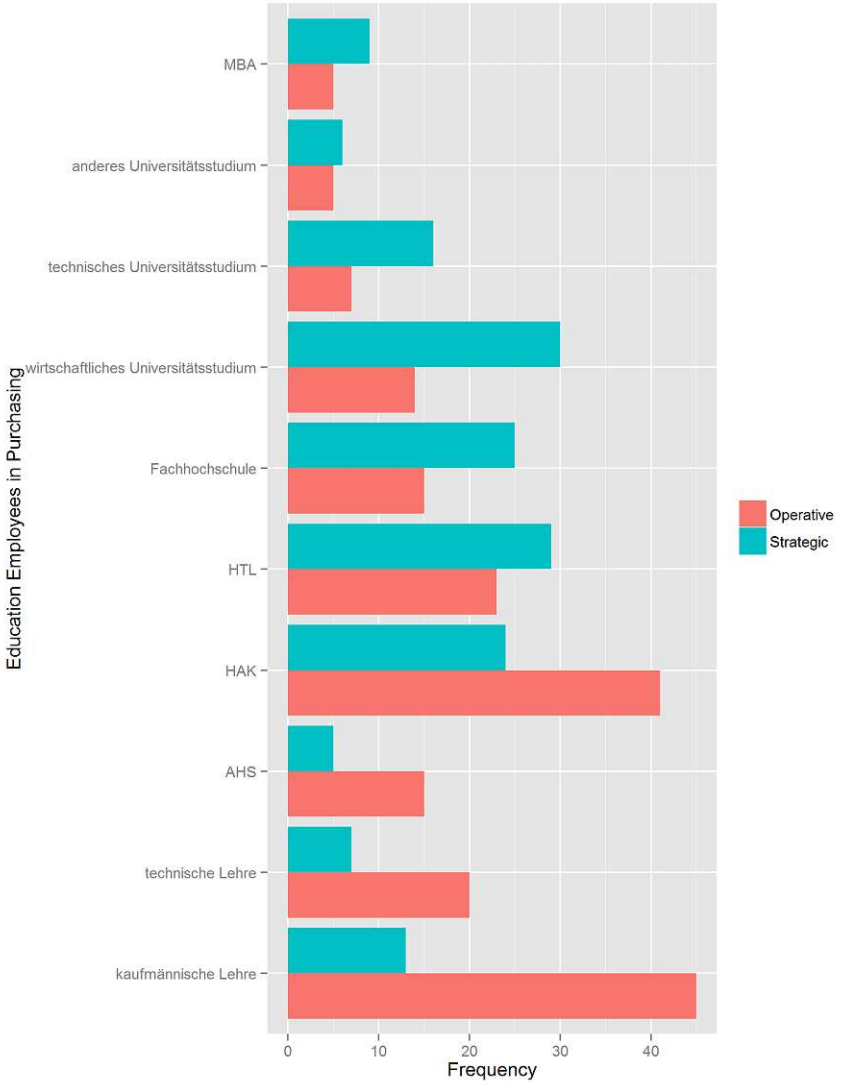

Figure 4.34: Current educational situation: operational vs. strategic

With regards to what is seen as the minimum education for new employees in operative purchasing, more than half of the participants still consider a commercial apprenticeship to be sufficient. About one quarter thinks that a technical apprenticeship or a normal high school degree is adequate. More than half of the participants also consider a commercial high school degree to be adequate, less than one third require a technical high school degree. Nearly no company requires any higher degree for operative buyers. It has to be considered that participants have been enabled to select multiple choices as minimum requirement.

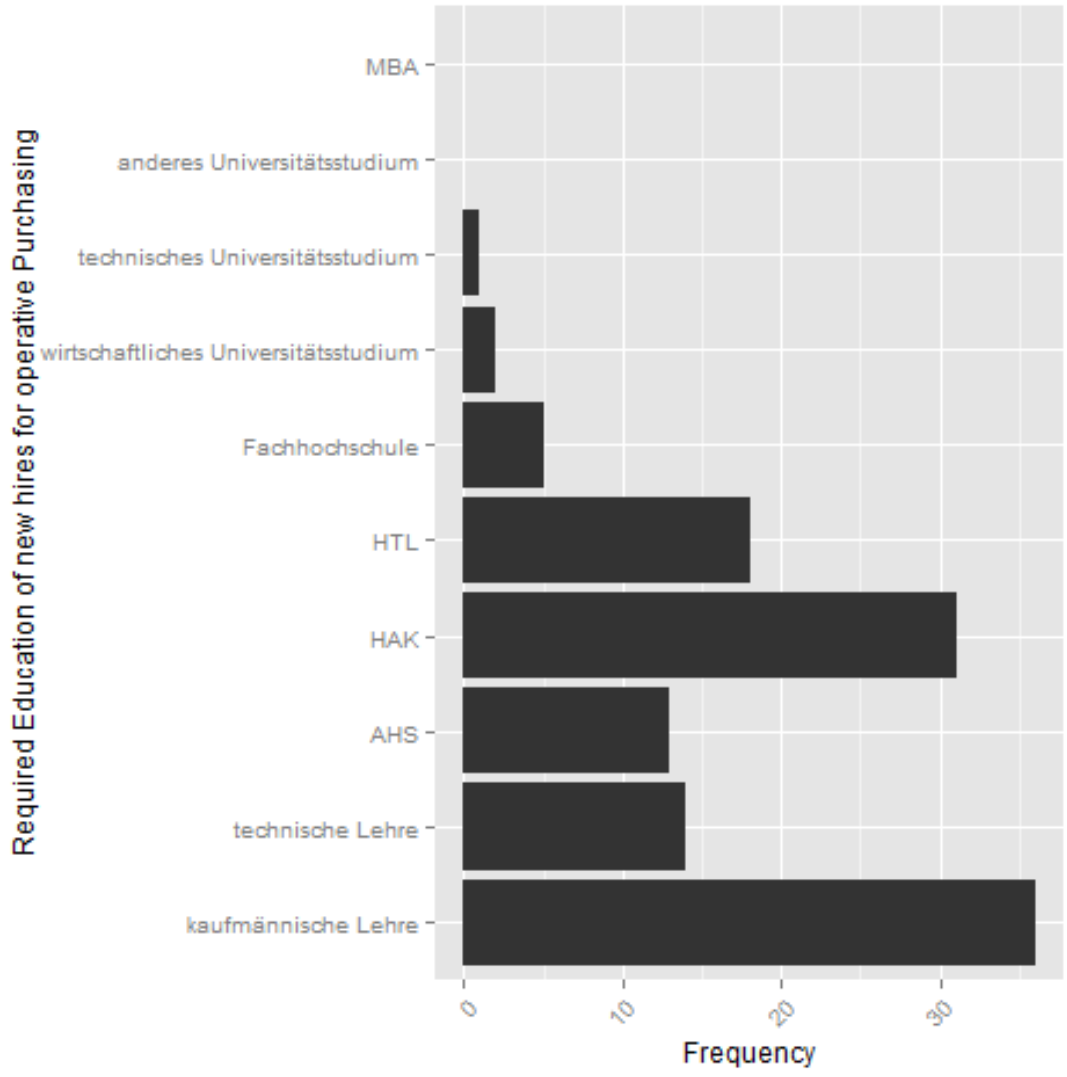

Figure 4.35: Minimum education of operational purchasing employees

The minimum education for strategic buyer is significantly higher than the one of operative buyers: Only a small minority consider an apprenticeship or a normal high school degree to be adequate. Approximately 40% consider a commercial high school degree, a technical high school degree, a degree from a university of applied sciences or a commercial university degree to be necessary. A substantially lower number of participants requires a technical university degree for strategic buyers. blablabla

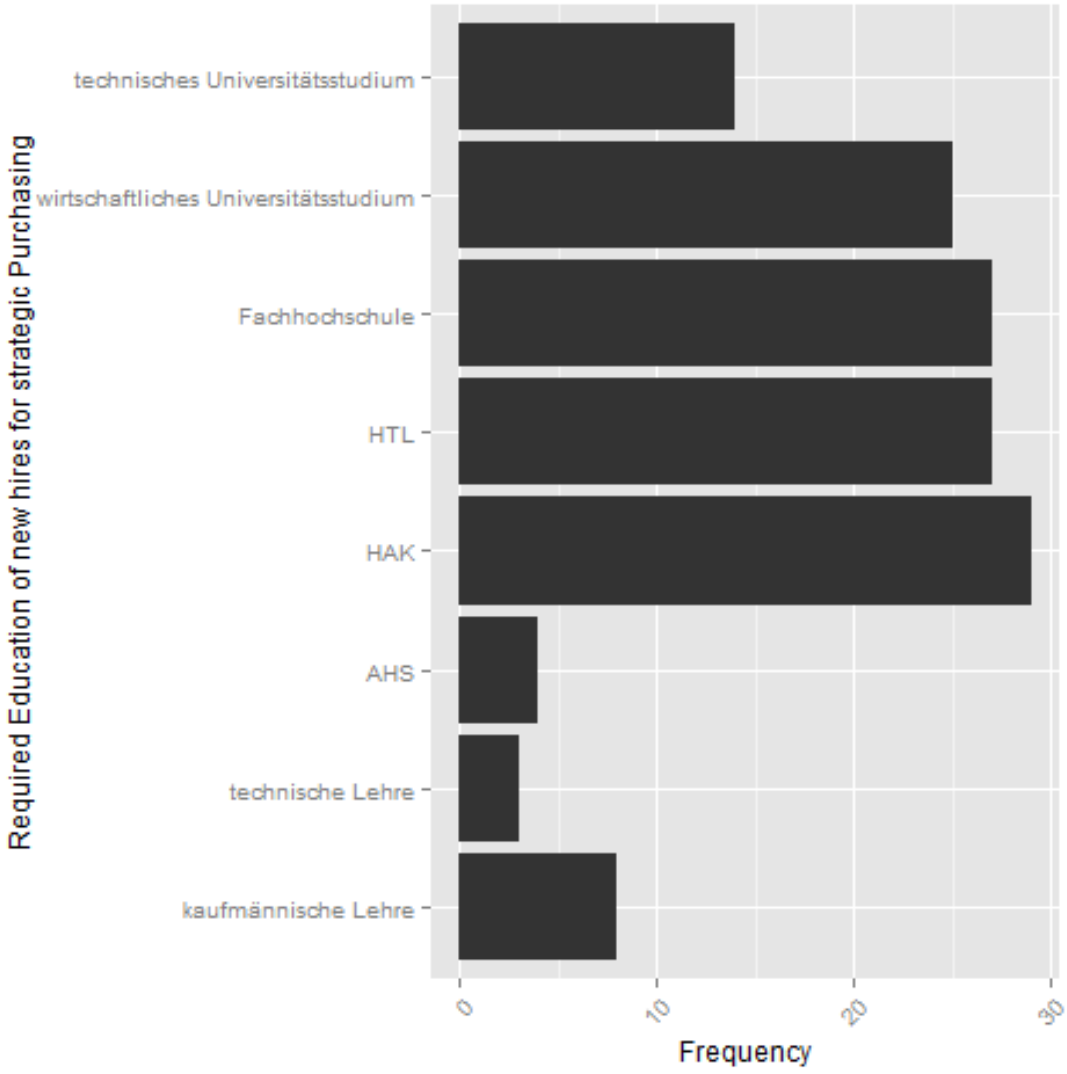

Figure 4.36: Minimum education of strategic purchasing employees

The minimum education of strategic buyer are as expected substantially higher than the one for operative buyers. While the gap is relatively modest for commercial or technical high school

degrees (graduated of ”HTL” or ”HAK” seem to be suitable for both, operative and strategic buying), the situation is different for those who have an apprenticeship or a normal high school degree (they are considered suitable only for operative jobs) and for graduates of a university of applied sciences (only required for strategic jobs). Technical university degrees are required very rarely (compare 3.2.2 on page 67). As one of the interviewees in the interviews that were conducted before the survey stretched, it is very hard to convince professionals with an advanced engineering degree to work in purchasing.[7]

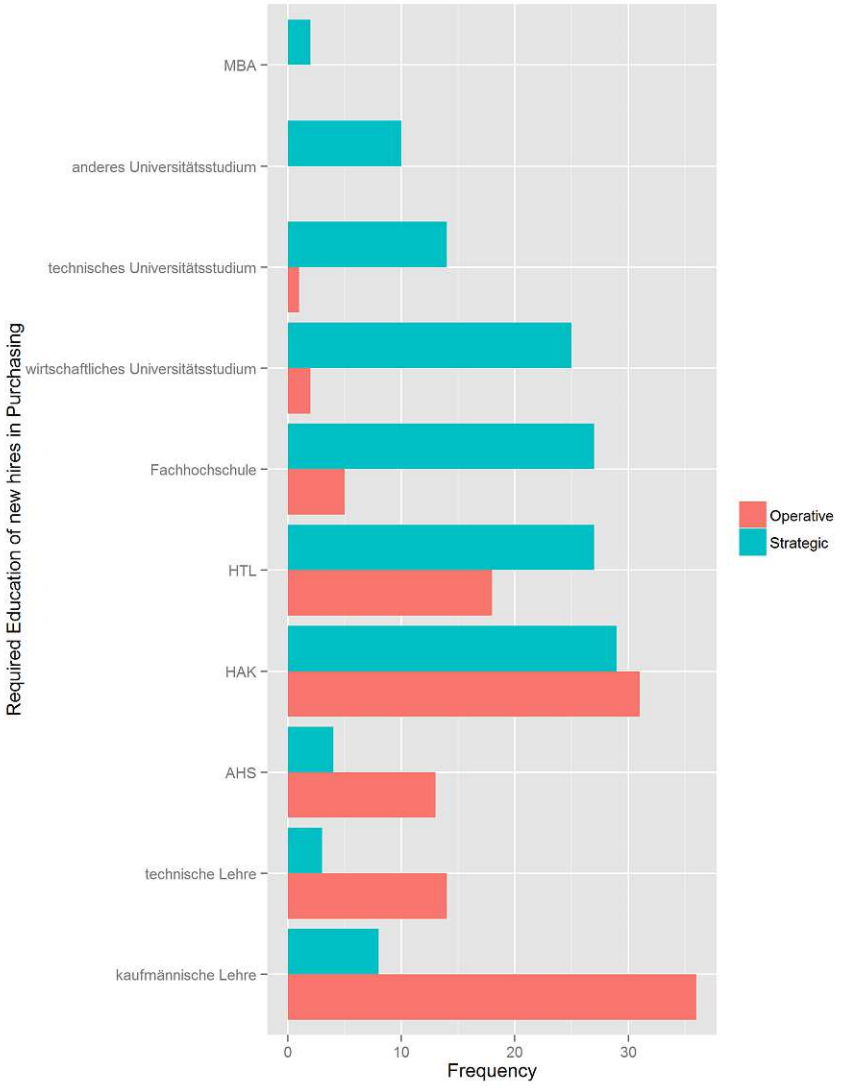

Figure 4.37: Minimum education: operational vs. strategic

Participants were asked to rate fifteen skills with regards to their importance for purchasing employees. Surprisingly, the skills that are most highly rated are all soft skills, namely working style, negotiation and communication skills. Purchasing Know-How is only ranked as number four. Interesting as well, is the unimportance of other foreign languages. It was mentioned in the interviews[7], that some firms favour supplier with either German as communication language for easier communication. Therefore, it can be suggested, that additional languages are not required of purchasing professionals, unless needed for special sourcing markets.

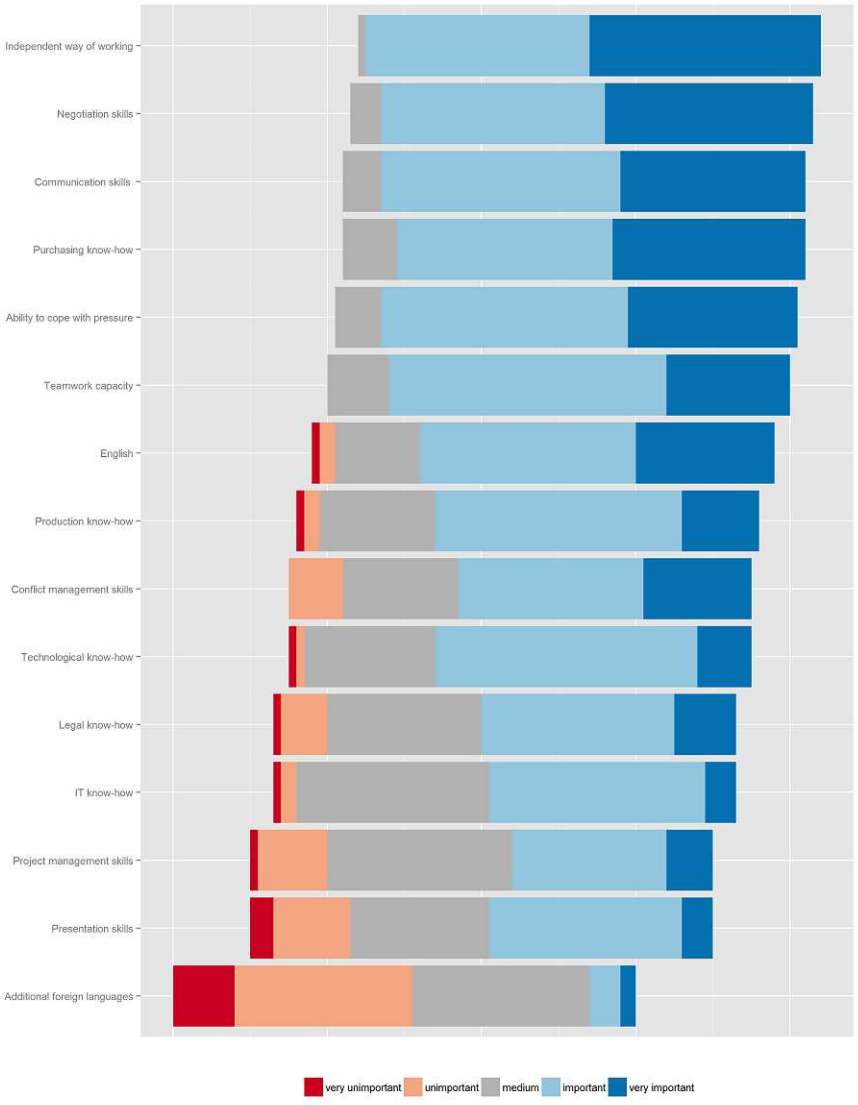

Figure 4.38: Necessary skills for purchasing employees today

The participants were further asked to estimate the development of the fifteen skills over the next ten years. The result suggests, that purchasing is becoming more skill demanding overall. There were hardly any replies saying the skill requirement will decrease. The participants see especially the pressure on purchasing gaining. Interestingly, the hard skills like Legal or Technological know-how are rated among the more important skills in the future.

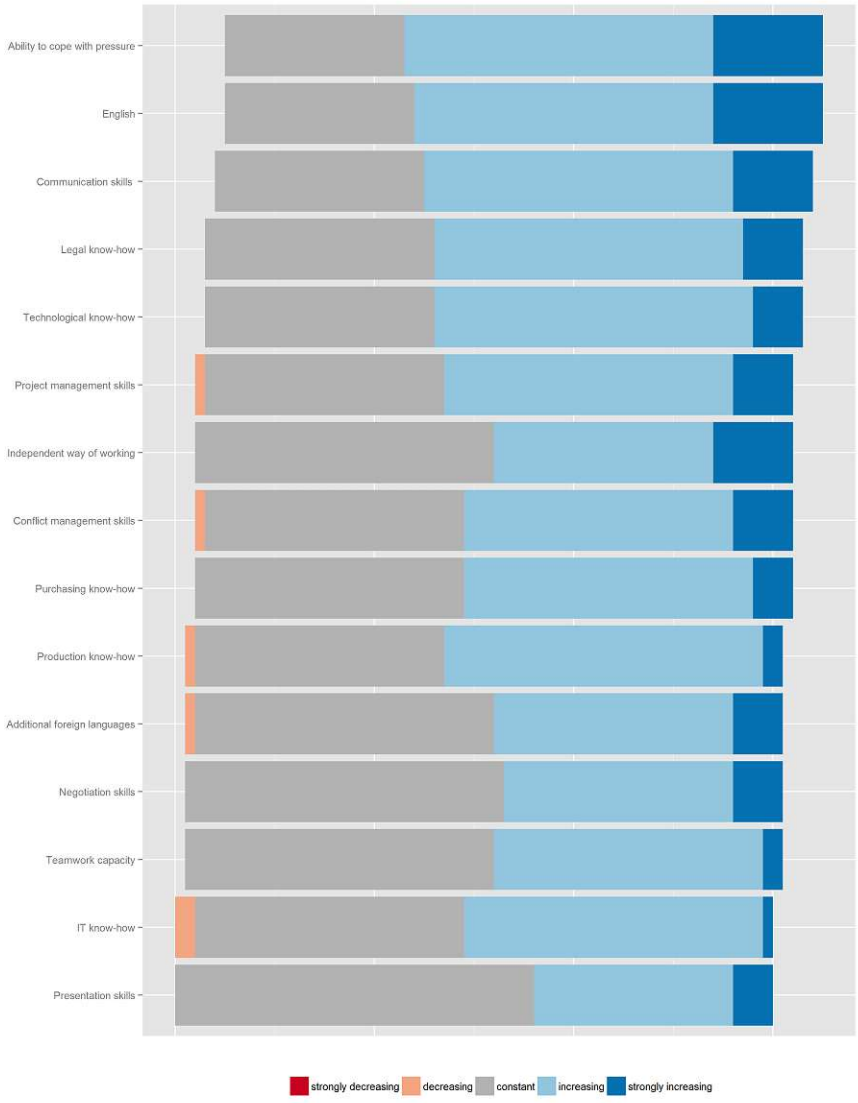

Figure 4.39: Necessary skills for purchasing employees in ten years

The combined visualization again shows the raising demand on purchasing professionals. One can identify three key skills in the next years, namely the *ability to cope with pressure*, *communication skills* and *English*. All three are on a high level and gain in the next years, which can also be seen in table 4.3 on the next page.

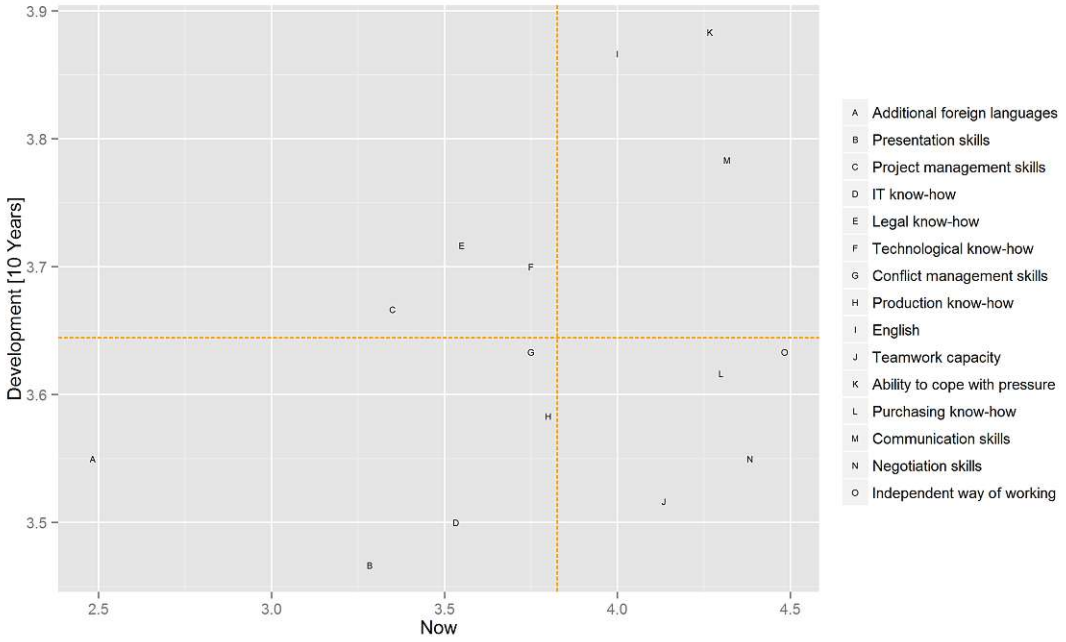

Figure 4.40: Necessary skills: today and future development

Table 4.3: Importance of skills for purchasing employees

Department / mean importance	*today*	*in ten years*	*development*
Ability to cope with pressure	3.27	3.88	**+44%**
English	4.00	3.87	**+43%**
Communication skills	4.32	3.78	**+39%**
Legal know-how	3.55	3.72	**+36%**
Technological know-how	3.75	3.70	**+35%**
Project management skills	3.35	3.67	**+33%**
Independent way of working	4.48	3.63	**+32%**
Conflict management skills	3.75	3.63	**+32%**
Purchasing know-how	4.30	3.62	**+31%**
Production know-how	3.80	3.58	**+29%**
Additional foreign languages	2.48	3.55	**+28%**
Negotiation skills	4.38	3.55	**+28%**
Teamwork capacity	4.13	3.52	**+26%**
IT know-how	3.53	3.50	**+25%**
Presentation skills	3.28	3.47	**+23%**
Mean	3.83	3.64	**+32%**
Standard deviation	0.77	0.65	

To sum up, the required skill set is mainly focused on soft skills, rather than hard skills. Although almost every skill is on average rated as important (mean: 3.83) the single importance differs more. The next ten years will demand more of purchasing professionals, however, the increasing demand is rated just above staying constant (mean: 3.64).

4.2.4 General purchasing trends

There is no clear message with regards to whether outsourcing or off-shoring of purchasing activities is increasing. Nevertheless, it can be reasoned that outsourcing of purchasing activities seems to be a more popular choice for the participants' companies. However, it has to be recognized that the sample might not be ideal to answer these questions, as activities like off-shoring or outsourcing of internal shared service providers (like the purchasing function) is normally something that is primarily done by multi-national corporations. As the sample mainly consists of SMEs, this topic might not be so relevant for them.

With regards to automation of operative tasks, there can be no doubt about where the trend is heading to: Operative tasks are increasingly more automatized and this trend will continue. The same is true for importance of strategic tasks: As operative tasks get more and more automatized, the focus increasingly shifts to strategic tasks. This also fits in the picture that has been shown in the previous plots (compare figure 4.18).

Participants also mainly agree with the proposition that purchasing professionals have to manage large commodity portfolios and to a slightly smaller extend to the propositions that the technology focus increases and that the legal requirements are rising.

Surprisingly, there is no consensus that human resources deployed in operative purchasing will be shifted to strategic departments as would be expected from the fact that operative purchasing automation seems to be growing. However, it seems the survey participants are not expecting such a development.
With regards to standard parts being purchased, our survey employees are basically not expecting any major change, while they think that supplier will be integrated more closely. Furthermore, there seems to be a general trend towards a supplier market consolidation.

It seems that our survey participants have recognized the benefits of advanced IT tools and also expect Big Data analysis to grow in importance. This might also be linked with their perception that Supply Chains will get more complex and global. Furthermore, our participants expect ecological and social sustainability issues to grow in importance in the future.

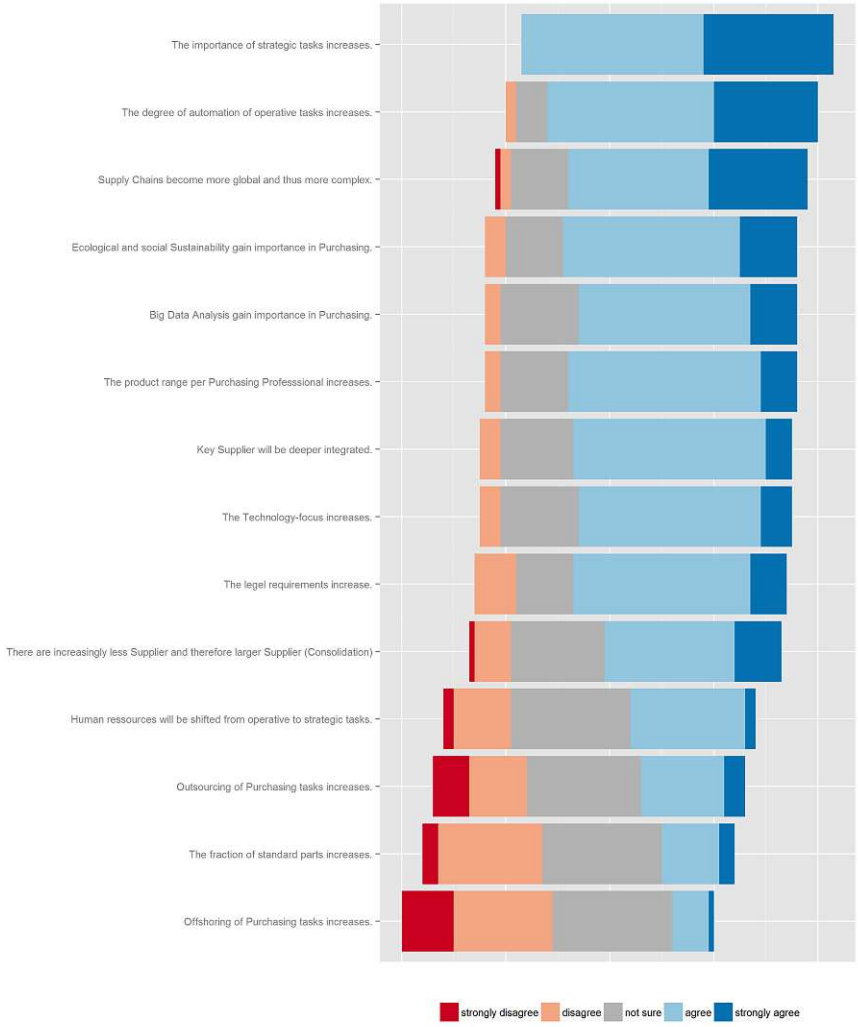

Figure 4.41: General purchasing trends

As expected, there are more males than females working in purchasing. The gap between the number of male and female employees is relatively large for strategic buyers, while the male / female ratio is about 50% for operative buyers.

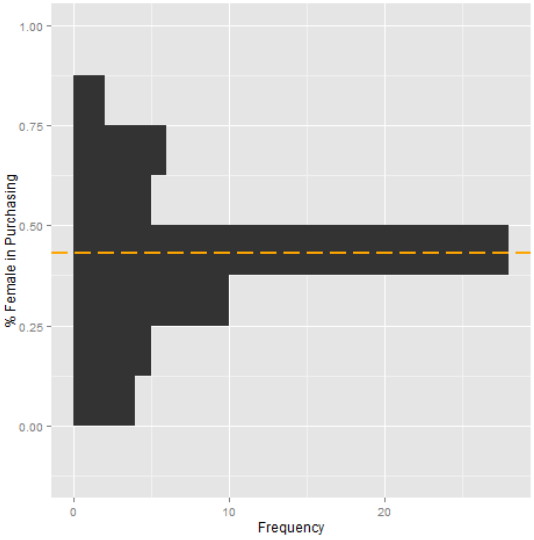

Figure 4.42: Females in purchasing

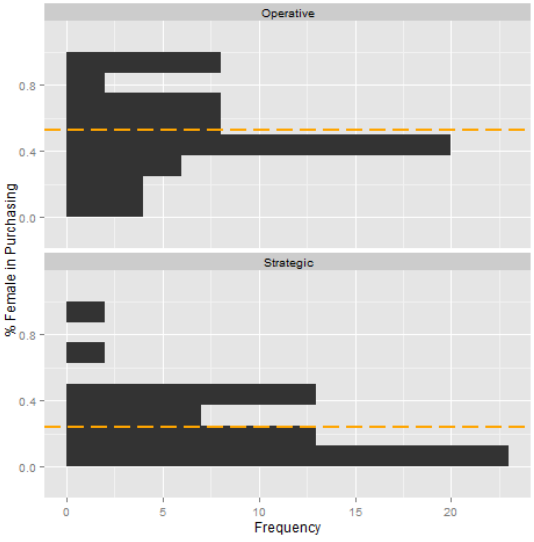

Figure 4.43: Females in purchasing: strategic vs. operational

Only about 3% of all CPOs in the companies participating in this survey are of female gender. The vast majority are male.

4.3 Relations between different data

The questionnaire contains demographic data about the participant and the company on the first two pages. These are the possible data fields for clustering the data and comparing the clusters. This chapter shows the investigated correlations between different indices and the given data. Within the following paragraphs the selection and creation of the indices is explained and the questions the clusters are applied to are listed.[1]

The first possible clustering fields are those of the participant. The possible fields are gender, age, highest education, procurement experience and responsible procurement volume. Gender cannot be take for evaluation, as only a few responses were from females. The position also contains almost only chief procurement officer (see figure 4.3 on page 88), and is is therefore also not usable for clustering. Procurement experience and procurement volume will not provide answers concerning the research question. Procurement experience is very individual and will, therefore, not result in meaningful clusters and procurement volume depends on the individual organization within the procurement functions and on company size, which is applied via company demographics. These leaves age and highest education as criteria to cluster data from the participant demographics.

The second possible clustering fields are those of the companies. The details provided about the companies are industry, employees (overall and only in procurement), revenue, procurement volume, production types, purchased materials, supplier dependency and purchasing markets. The industry information reduces the cluster size a range between three and fifteen, as well as more than half the participants selected ”other” as industry, therefore, this index is not applicable (see figure 4.6 on page 91). Almost all participants purchase all given materials, therefore, this field can not be applied to cluster the data. For companies, this leaves employees, revenue, procurement volume and supplier dependency for clustering.

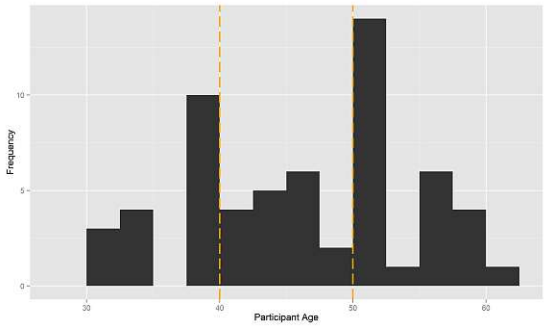

Figure 4.44: Participant Age

[1]The explained clustering also fits and could be listed in the method chapter. However, as it based on the collected data and the understanding is essential for the result descriptions, it is presented here.

Participant clusters This paragraph describes, how the answers are grouped for the participant demographic data. The criteria to group the responses, as explained before, are age and education. Age will be grouped using the 33% and the 66% quantile, they are 40 and 50 years for our data set. The result will be three groups of participants, namely young (age <40), middle (age 40-50) and elder (age >50) participants as shown in figure 4.44 on the facing page.
As the education is an ordinal scale, the Austrian education system will be used to categorize the responses. The different groups are apprenticeship, high school, university. The group apprenticeship consists of the answers "kaufmännische Lehre" and "technische Lehre", high school includes "AHS", "HAK", "HTL" and university is everything else, including universities of applied sciences and MBA programs.
The participants cluster is only analyzed in combination with the required education of new hires.

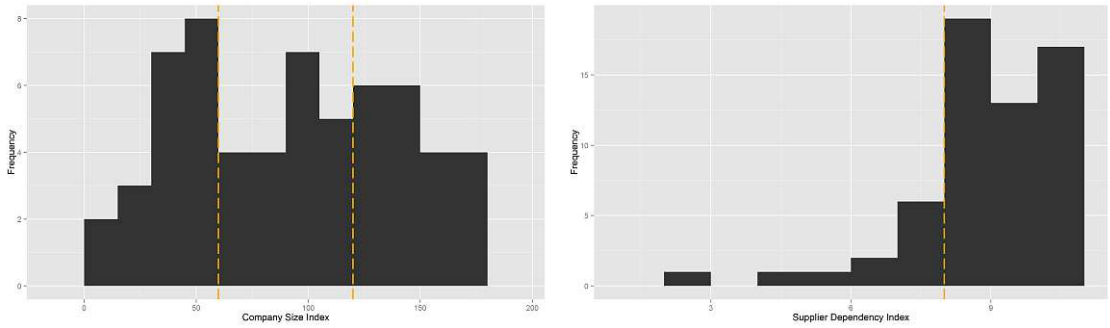

Figure 4.45: Company Index: left size, right supplier dependency

Company clusters This paragraph explains the composition of the company related indices. The fields usable for clustering are, as explained before, employees, revenue, procurement volume, supplier dependency and purchasing markets. The first grouping will be via the company size. Therefore, the employees, the revenue and the procurement volume are aggregated. For the employee number, only the overall employee number is considered. The calculation used to calculate the composite index is $size = rank(\#employees) + rank(revenue) + rank(procurementvolume)$. Thereby, rank represents the number rank of the respective number when all values are ordered by size. Rank one is given to the lowest number, meaning e.g. the company with the smallest number of employees is assigned rank one. The resulting number is used to split the responses in three groups with almost equivalent size. The split is done as shown in figure 4.45.
The second categorization is supplier dependency, which is again a composite index of the two questions "Supplier Knowhow is of high importance." and "Supplierinnovation is important." (see figure 4.16 on page 100). The responses are also combined using a ranking together with the sum as used for the company size before. The ranks here represent the answers (1-5) of the Likert scale. The responses are split in two groups, stronger supplier dependency and weaker supplier dependency. The split, as visible in figure 4.45 is at seven, which means two times undecided or lower importance as answer.

Statistical validation The statistical validation method used, is a Welch t test. In all the later applications a table is provided, indicating the test statistic, the critical values, the degrees of freedom, the significance level and the test result. As some indices have more than two groups, multiple t tests were applied, which require an alpha error correction. Therefore, the conservative Bonferroni correction method was applied. The resulting significance values are also listed in the result tables.

Analyzed questions Finally, the clusters have to be applied to the questions. Therefore, the following questions are chosen as relevant in order to answer the research question. The focus lies, therefore, mainly on tasks, organization and skills. Table 4.4 shows the questions the indices are applied to. The green coloured "x" stands for a significant deviation of the means of the clusters. The red coloured "x" stand for no significant deviation in the means of the clusters. The t-test results for all index applications are omitted within this chapter and can be found in the appendix C on page 195. Note, that some questions consisted of check boxes. Therefore, some answers were never ticked and could not be used for the analysis. They are, however, listed within the tables as not available (NA) to give a complete overview.

Table 4.4: Application of cluster indices to questions

	company size	supplier dependency
Tasks now	x	x
Tasks future	x	x
Other departments now	x	x
Other departments future	x	x
Development phases now	x	x
Development phases future	x	x
Type of integration	x	x
Position of CPO now	x	x
Position of CPO future	x	x
Organization of purchasing	x	x
Trends in organization	x	x
Status	x	x
Current education of empl. op. purch.	x	x
Current education of empl. strat. purch	x	x
Required education of empl. op. purch.	x	x
Required education of empl. strat. purch	x	x
Required skills now	x	x
Required skills future	x	x

4.3.1 Tasks

There are differences between how different sized companies perceive the current importance of tasks as shown in figure 4.46, however, only two such differences are statistically significant on the 95% level as indicated in table C.1 on page 197: Supplier development is perceived significantly more important by small companies. Furthermore, small companies consider participating in R&D processes significantly more important than large companies.

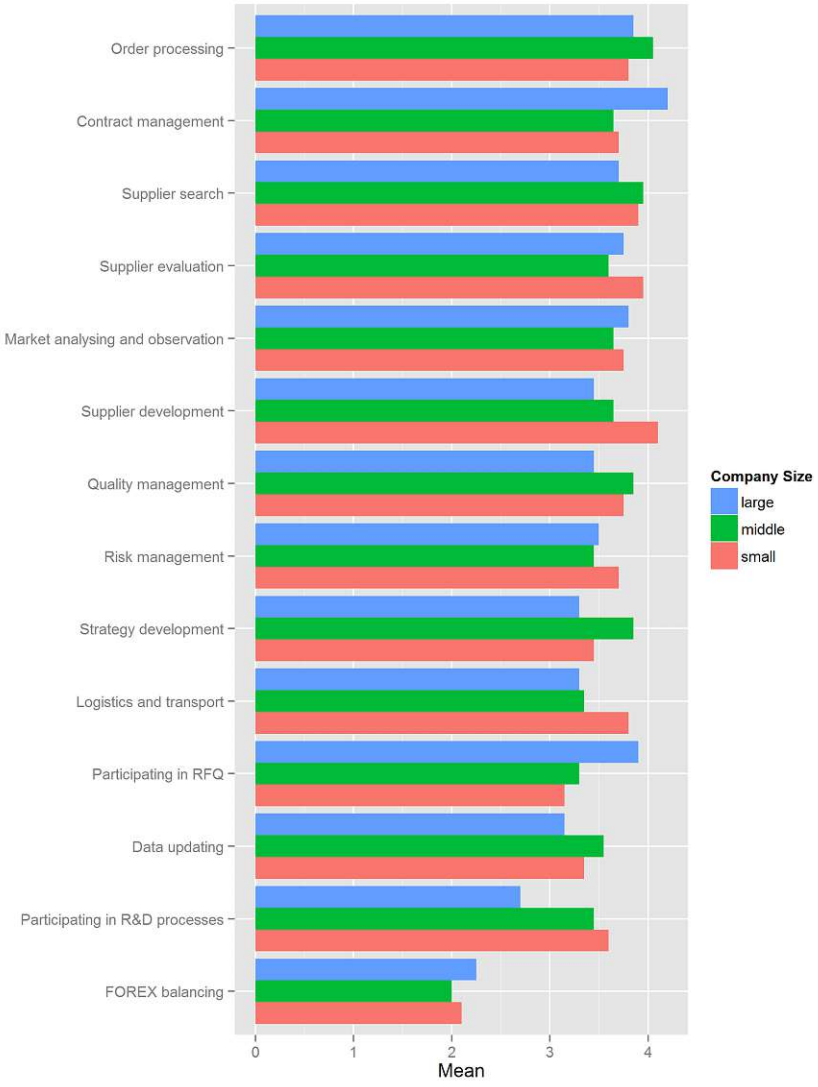

Figure 4.46: Importance of tasks and company size today

As shown in figure 4.47, concerning the future development of the importance of purchasing tasks there are not too many significant differences as well: There is a significant difference between the way small and medium sized companies see the future development of supplier evaluation (compare table C.2 on page 199. Small companies consider supplier evaluation to be significantly less important in the future than medium sized companies.
Furthermore, medium sized companies expect data updating to be more important in the future than large companies.

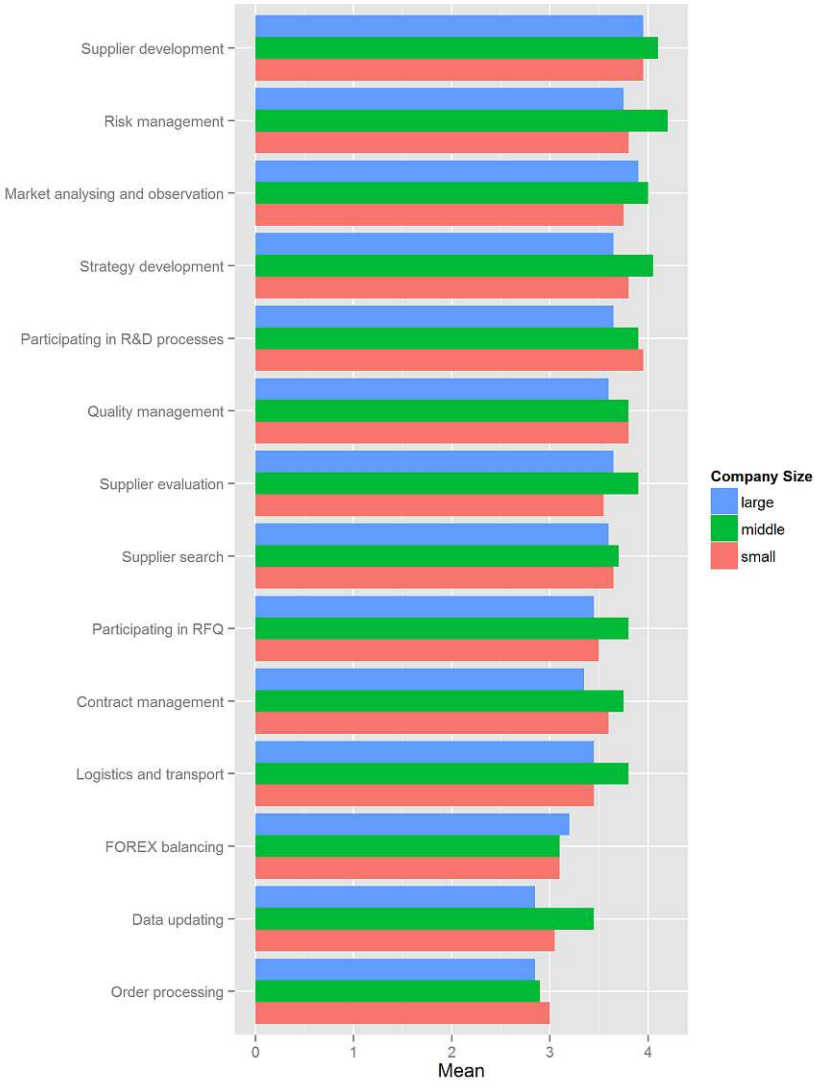

Figure 4.47: Importance of tasks and company size in 10 years

When the perceived importance of tasks is matched with the level of supplier dependency, four significant differences can be observed (compare table C.3 on page 200: Strongly supplier dependent companies perceive the importance of supplier evaluation to be significantly more important than companies with a lower level of supplier dependency as indicated in figure 4.48.

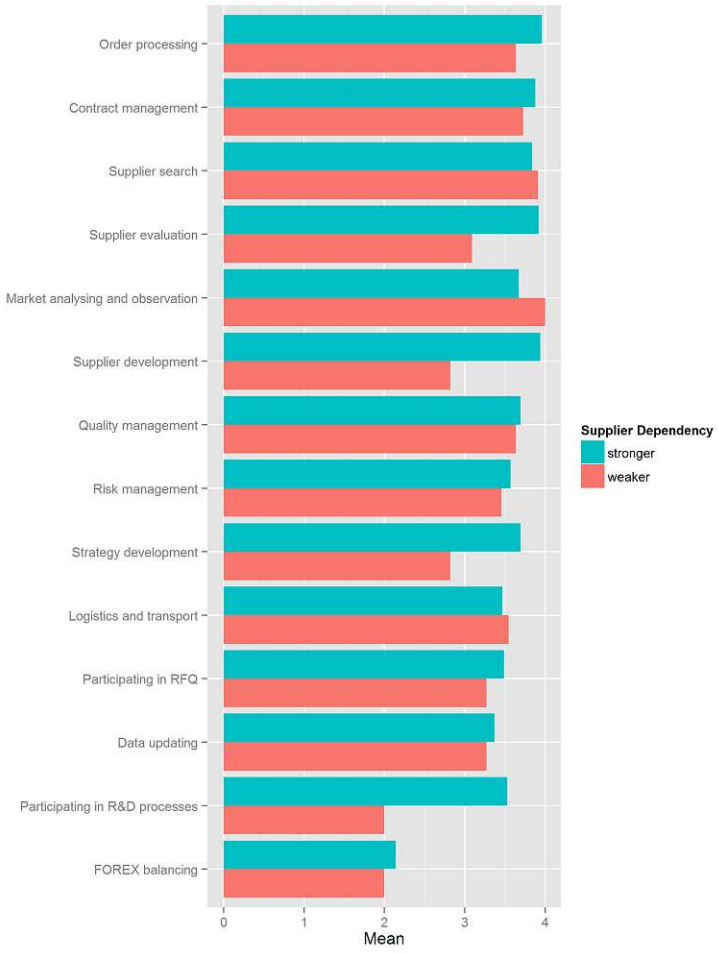

Figure 4.48: Importance of tasks and supplier dependency today

Furthermore, companies that feature a higher level of supplier dependency rate supplier development to be significantly more important than those with a lower level of supplier dependency.
The same is true for strategy development: Companies with high level of supplier dependency consider strategy development to be of higher importance.
The importance of participating in R&D processes however feature the biggest difference between the two groups: Those with a high level of supplier dependency rate participating in R&D significantly higher than the other group.

Regarding the future development of the importance of tasks, there are four tasks that are perceived significantly different by companies with a high level of supplier dependency compared to those with a low level of supplier dependency as indicated in table C.4 on page 201:
Market analyzing and observation is expected to gain more importance for those with a low level of dependency, the same is true for participating in RFQ processes and tasks associated with logistics and transport (compare figure 4.49).
Regarding the way participating in R&D processes, a significant difference can be perceived as well: Companies that feature a higher level of supplier dependency expect participating in R&D processes to grow stronger in importance compared to those who have a lower level of supplier dependency.

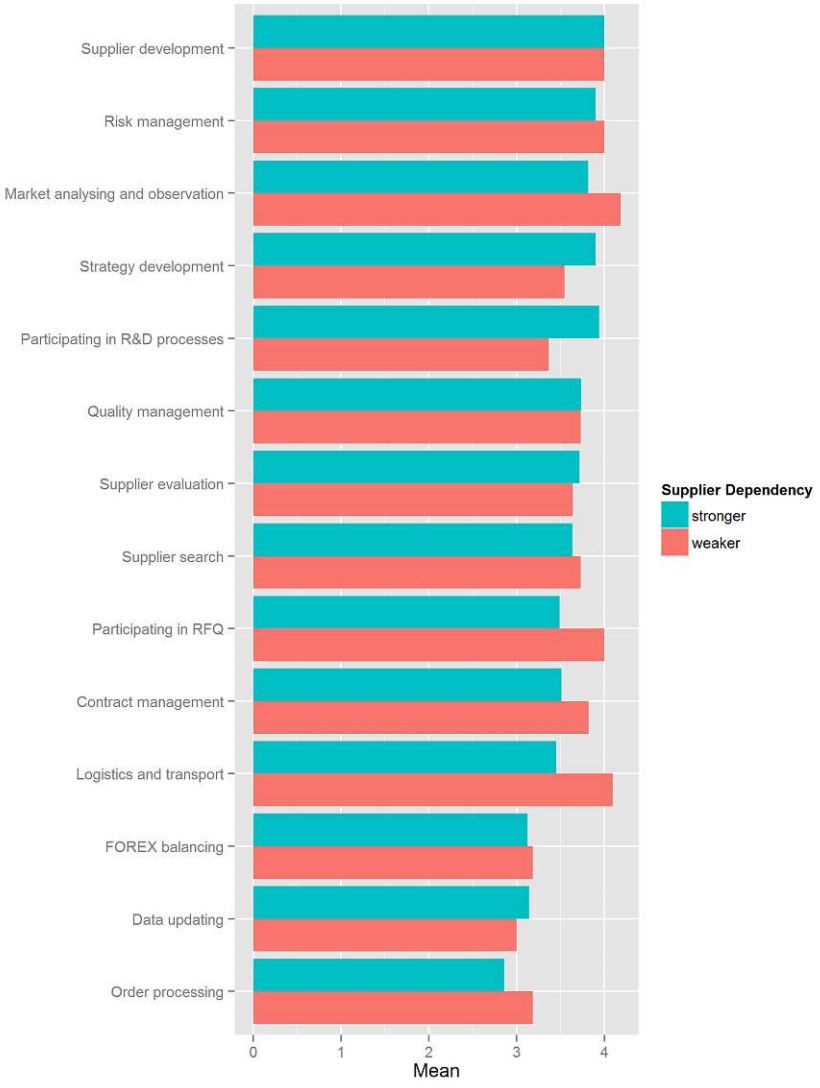

Figure 4.49: Importance of tasks and supplier dependency in 10 years

4.3.2 Organization of purchasing

Concerning the perceived importance of the cooperation with other departments, four significant differences between small, medium and large companies are visible as indicated in table C.5 on page 202: Small companies perceive the cooperation with the quality department to be more important than large companies, the same is true for the importance of the cooperation with the R&D department.
Furthermore, large companies consider cooperation with the legal department significantly more important than small companies and medium sized companies (compare figure 4.50).

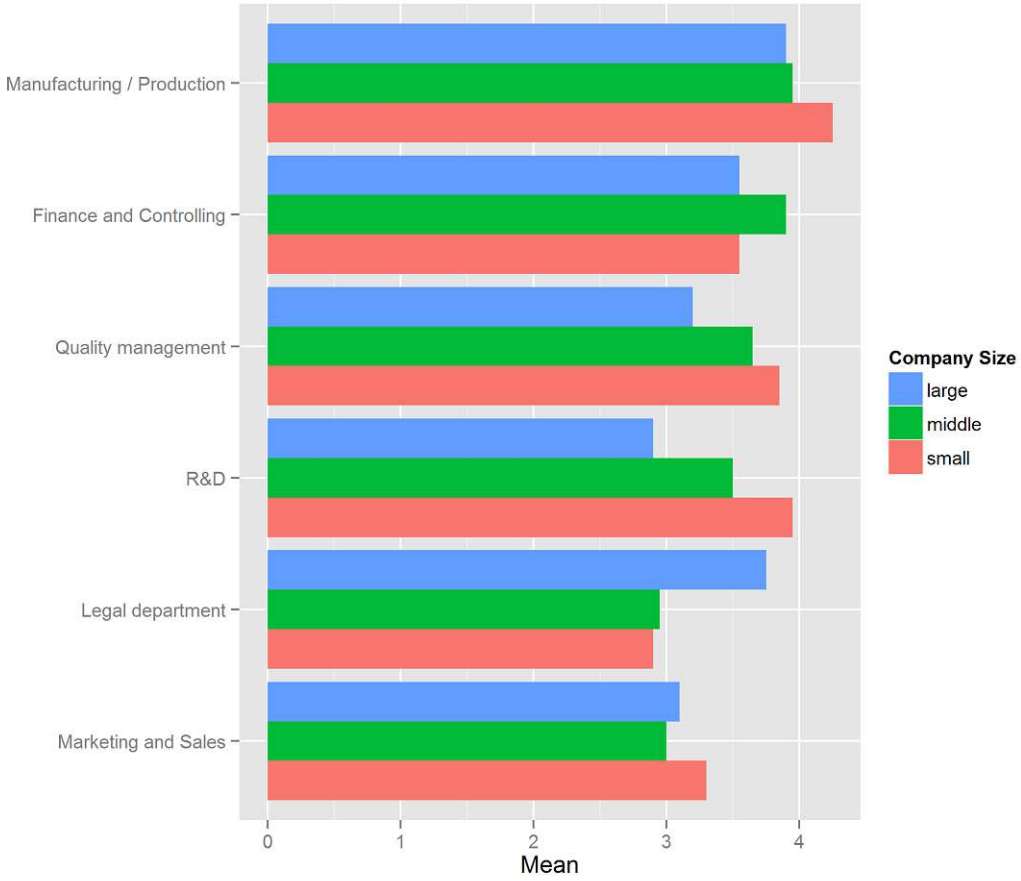

Figure 4.50: Relevance of other departments and company size today

With regards to the perceived relevance of other departments their is consensus among companies with weak and strong supplier dependency except for two departments: Companies featuring a higher level of supplier dependency perceive the cooperation with the R&D department and the quality management department to be of higher importance than those with a lower level of supplier dependency (compare table C.7 on page 204).

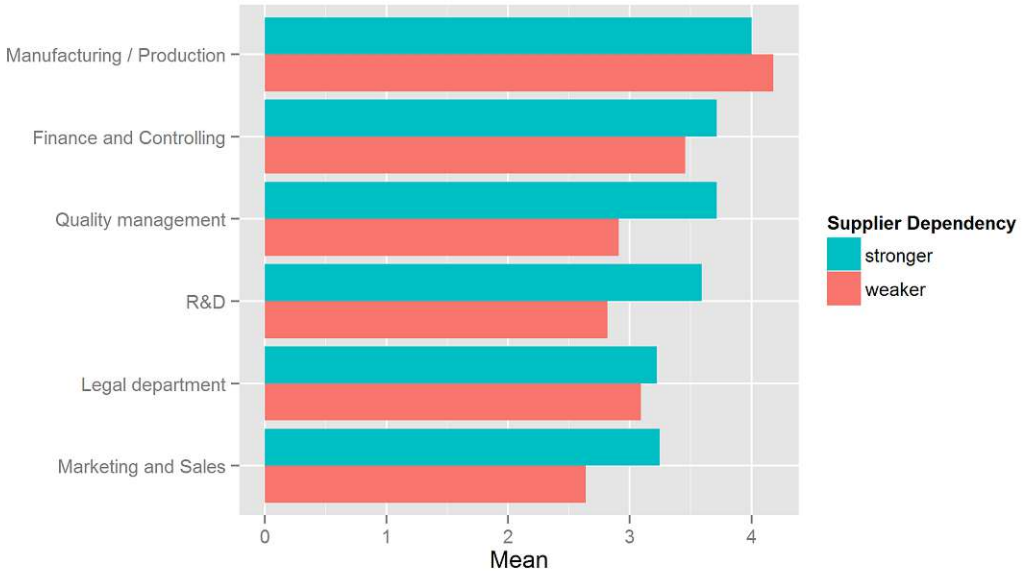

Figure 4.51: Relevance of other departments and supplier dependency today

4.3.3 Integration R&D

Except for being not involved in R&D at all, there is only one phase that shows a significant difference for companies of different sizes (compare C.10 on page 206): Large companies are significantly more likely to be involved in concept development in ten years than medium sized companies.

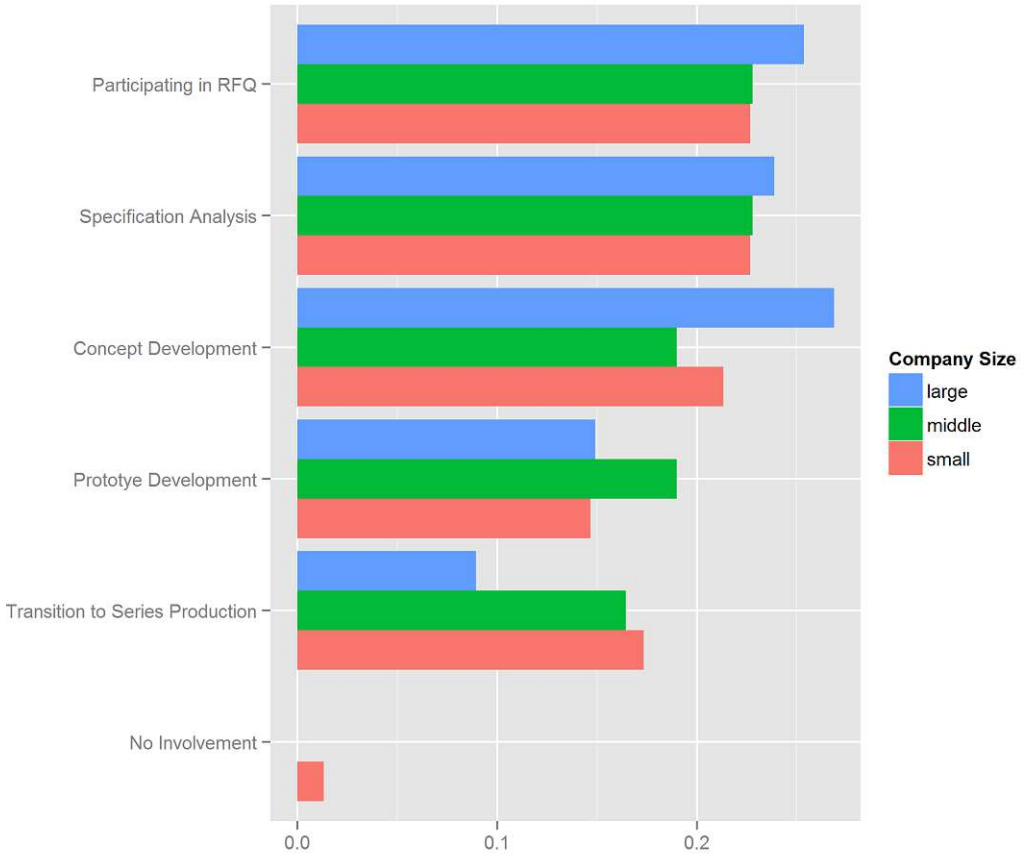

Figure 4.52: Integration in R&D and company size in 10 years

Figure 4.53 on the following page shows that the integration of purchasing into R&D process steps partially depends on the level of supplier dependency (compare C.11 on page 207): Companies featuring a lower level of supplier dependency are significantly more likely participate in RFQ creation, specification analysis and concept development.

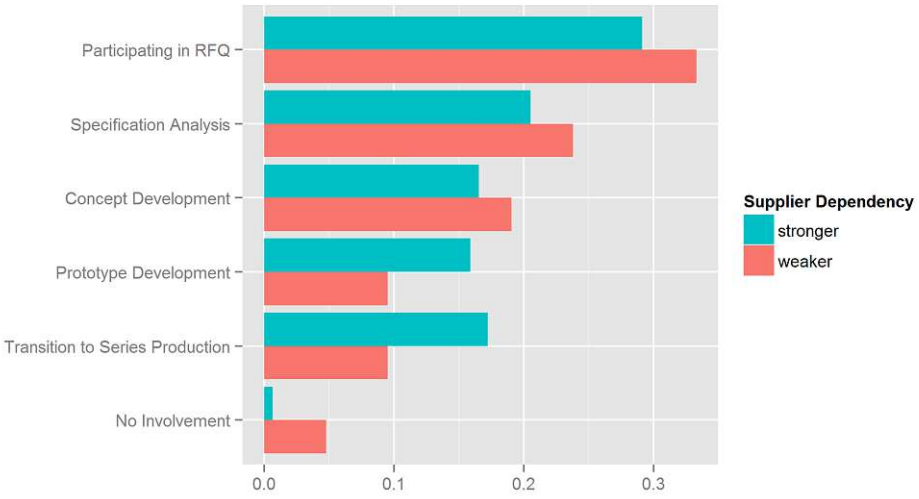

Figure 4.53: Integration in R&D and supplier dependency today

When it comes to the question how purchasing will be integrated into R&D processes in ten years, the picture changes considerably (compare C.12 on page 208): Strongly supplier dependent companies are expected to be stronger involved in RFQ creation and specification analysis in ten years, the opposite is true for concept development and prototype development.

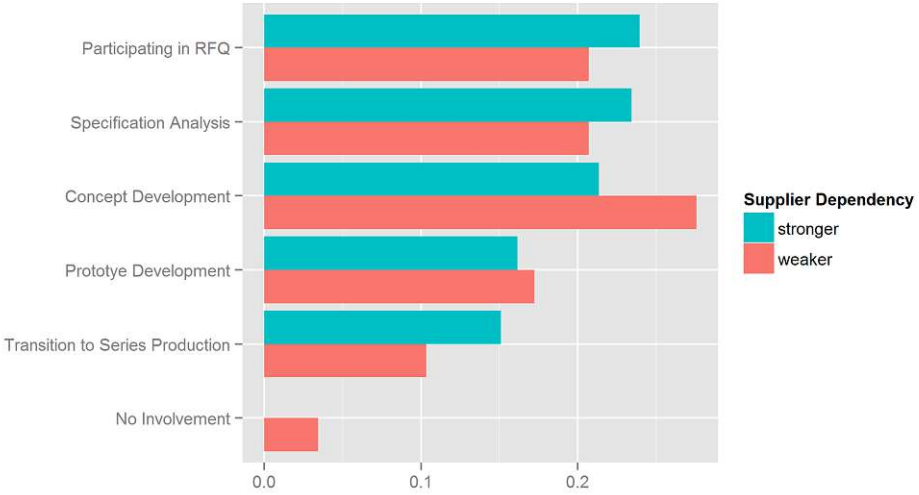

Figure 4.54: Integration in R&D and supplier dependency in 10 years

Figure 4.55 shows that the nature of the organizational integration into R&D is equal for companies featuring a higher and a lower level of supplier dependency except for the integration in form of a subtask of a purchasing employee where strongly dependent companies score significantly higher (compare table C.14 on page 209).

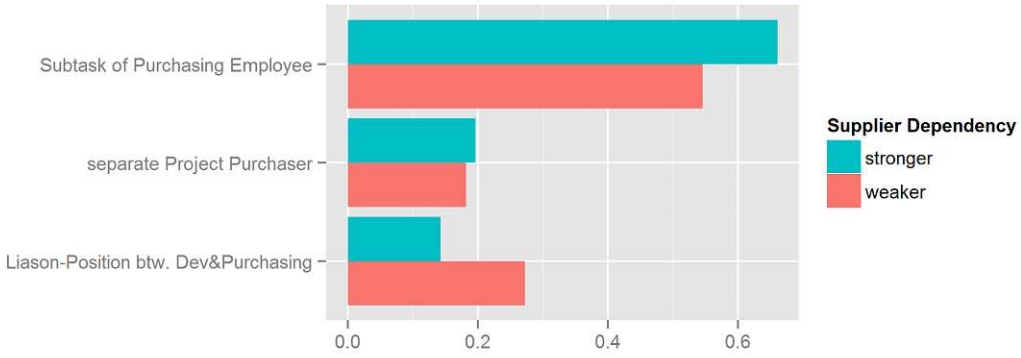

Figure 4.55: Organizational integration in R&D and supplier dependency today

4.3.4 Organization

While there is no significant difference for the likelihood a CPO is in the board or more than one level below the board, there is a difference for one level below the board as shown in table C.17 on page 210: Companies featuring a lower level of supplier dependency are more likely to have to CPO positioned one level below the board.

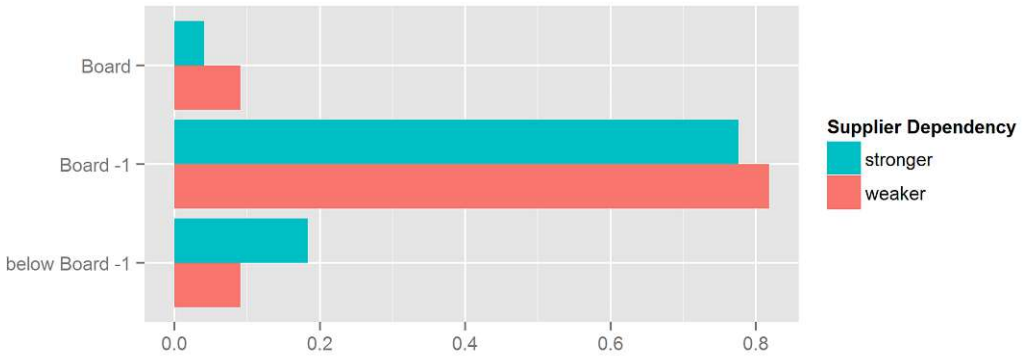

Figure 4.56: CPO position and supplier dependency today

Figure 4.57 shows that concerning the future organizational positioning of the CPO, there is a significant difference between companies featuring a lower and a higher level of supplier dependency: Those featuring a higher level of supplier dependency are more likely to one or more than one level below the board while there is no significant difference for board level CPOs. Also significantly more stronger dependent companies expect their CPO to be more than one level below the board in the future (compare table C.18 on page 211.

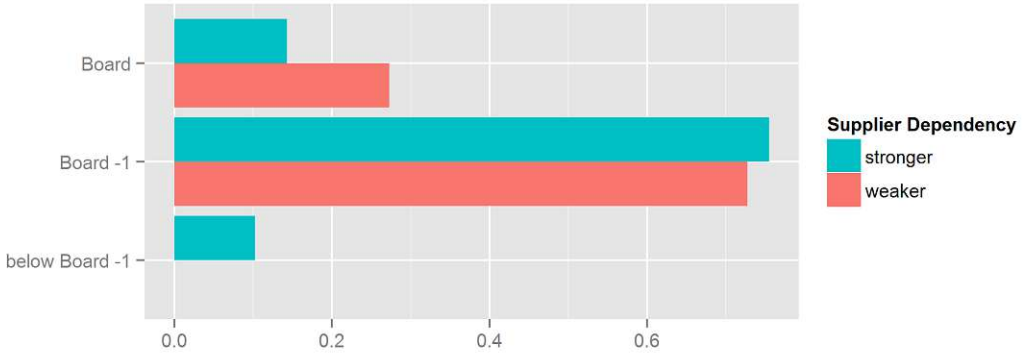

Figure 4.57: CPO position and supplier dependency in 10 years

Figure 4.58 shows that there are significant differences concerning the organizational purchasing structure between companies featuring a low respectively a high level of supplier dependency (compare table C.20 on page 212). Companies featuring a highly level of supplier dependency are significantly more likely to have a material or product group organization while those with a lower level of supplier dependency are more likely to have a matrix organisation. However, it has to be recognized that there are no companies that have a lower level of supplier dependency and a product group organisation.

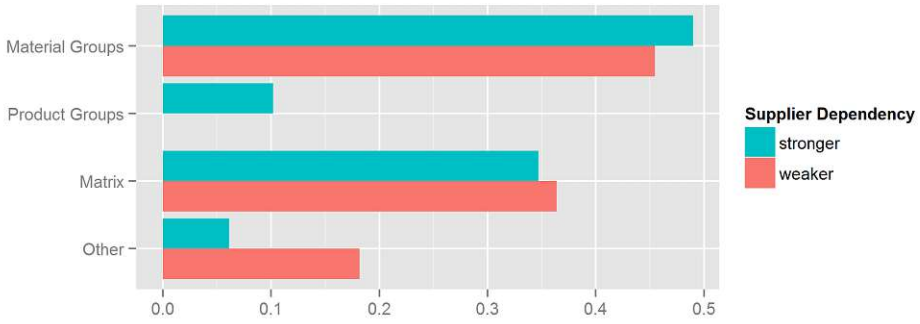

Figure 4.58: Organizational purchasing design and supplier dependency

Figure 4.59 shows that there are two answers that show a significant difference between companies that feature a low or high level of supplier dependency to this question asking for the participants opinion to purchasing trends and status quo.

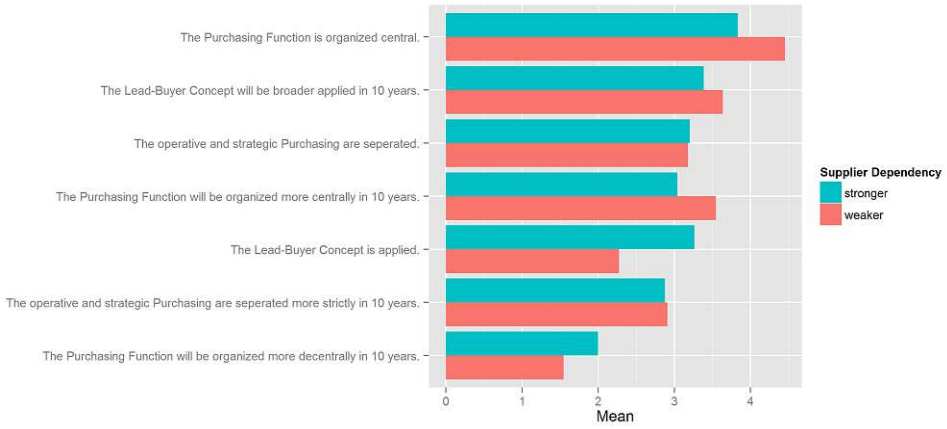

Figure 4.59: Purchasing organization trends and supplier dependency

The first answer shows that companies that feature a low level of supplier dependency are more likely to agree with the proposition that purchasing is organized centrally in their respective company. Furthermore, companies with a high level of supplier dependency have a higher

probability that the lead buyer system is applied in their own company (compare table C.22 on page 213).

The next set of questions aimed at evaluating the current status of the purchasing function, it future development and the way the purchasing success is measured. As shown in table C.24 on page 215 there is a significant difference between companies with a high and a low level of supplier dependency when it comes to the question whether the success of the purchasing function will be measured stronger with non-monetary indicators in the future: The score of the group featuring the lower level of supplier dependency is significantly higher (compare figure 4.60). However, it has to be considered that even the higher score is only slightly higher than neutral while the lower one is below 3 meaning the importance of non-monetary indicators will (further) decline.

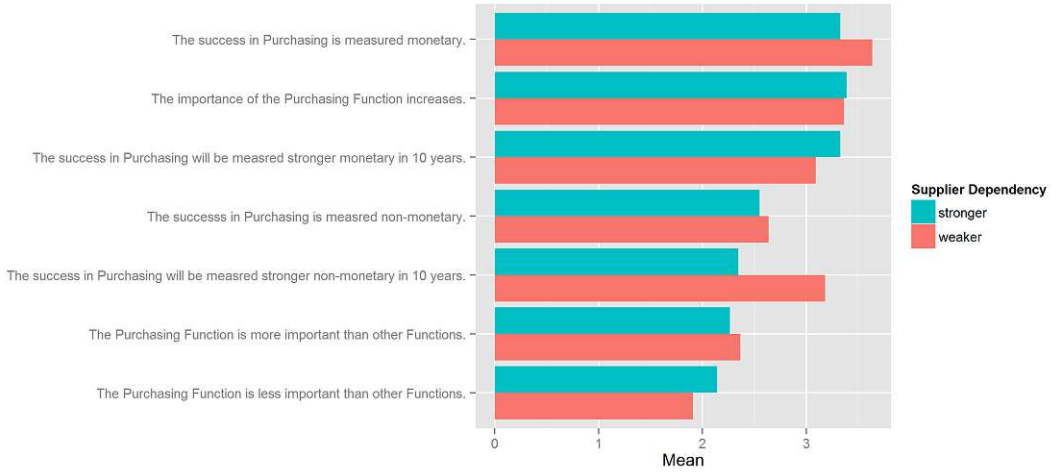

Figure 4.60: Purchasing status and supplier dependency

4.3.5 Education and Skills

Within this section, the results of the application of the participant age and education, company size and supplier dependency on the current and required education for operative and strategic purchasing professionals is described. Also the findings when clustering the required skills now and in ten years by company size and supplier dependency are described.

When comparing the current education of operative purchasing professionals in different sized company, differences for three education types are found. Figure 4.61 shows the relative amount of checks, that were given by the individual company-size-group. With a t-test one finds, that large companies have significantly less employees with an apprenticeship with economic focus than medium and small companies. The second finding is, that small companies employ less people with a ”HTL” education than the other two groups. Finally, personnel in large companies have more often a university degree with an economic focus than medium sized companies. Although figure 4.61 suggest that also small companies employ more economic graduates, the t-test shows no significant support for this hypothesis (compare also table C.25 on page 217).

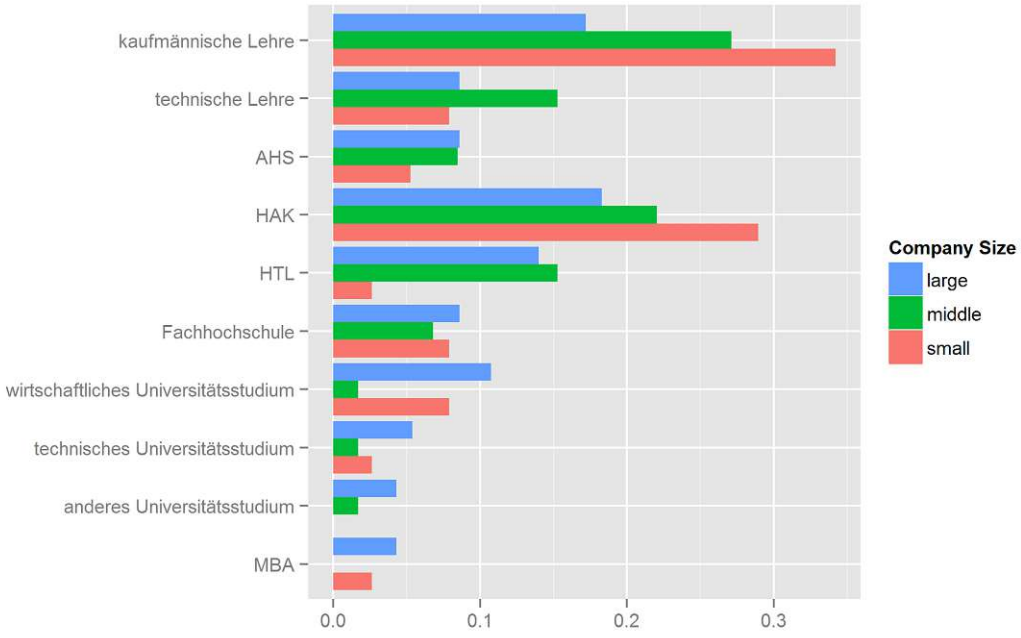

Figure 4.61: Current education of operative purchasing personnel and company size

As for strategic purchasing professionals, three significant deviants of the mean with respect to company size are found. First, medium sized companies employ more graduates from a ”HAK” than large companies. Second, workers of large companies hold more often a degree from a university with technology focus than workers in small companies. Finally, more employees in large companies hold a degree of a university with a focus other than economy or technology, as none of the small or medium companies reported to have employees with this kind of education. See figure 4.62 and table C.26 on page 218 for further details.

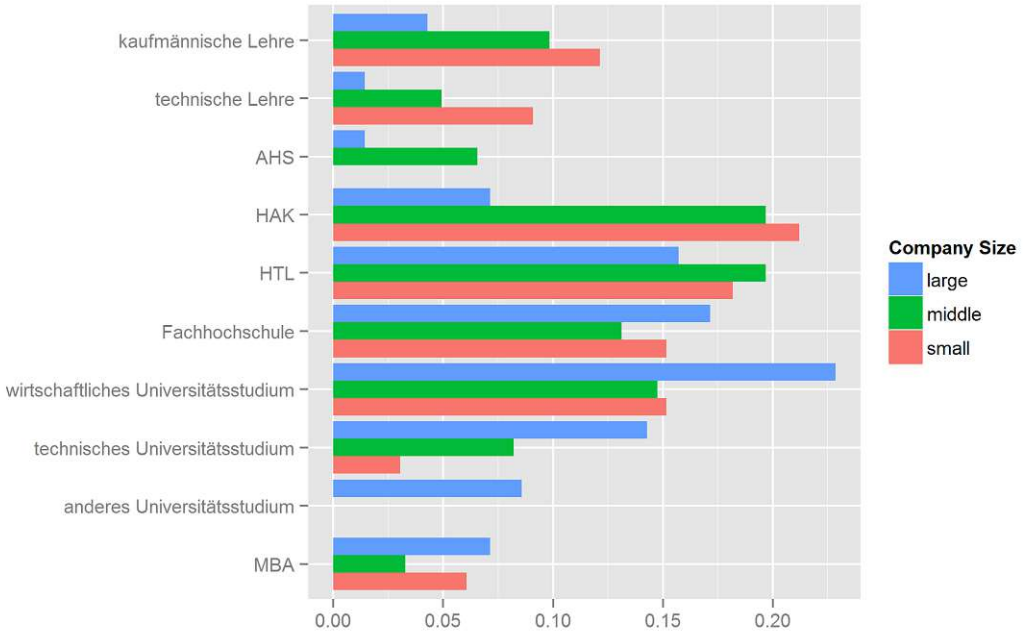

Figure 4.62: Current education of strategic purchasing personnel and company size

When considering supplier dependency as clustering criteria, one can find, that less dependent companies significantly employ more operative purchasing personnel with the following educations: ”kaufmännische Lehre”, ”HAK”, ”HTL”, ”Fachhochschule”. Figure 4.63 on the next page has to be considered together with table C.27 on page 219 as the number of less dependent companies is lower, there is a higher fluctuation range for this sample.

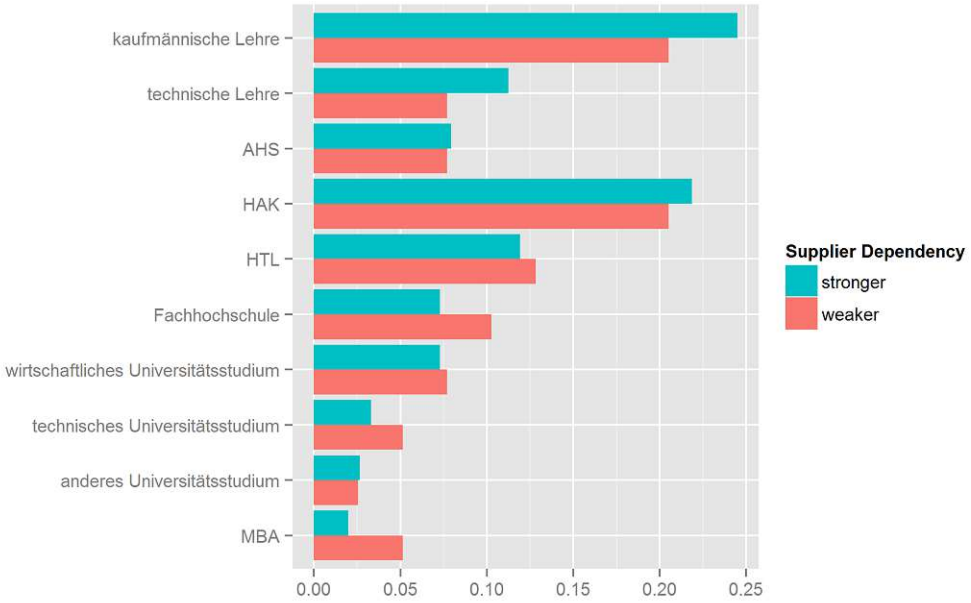

Figure 4.63: Current education of operative purchasing personnel and supplier dependency

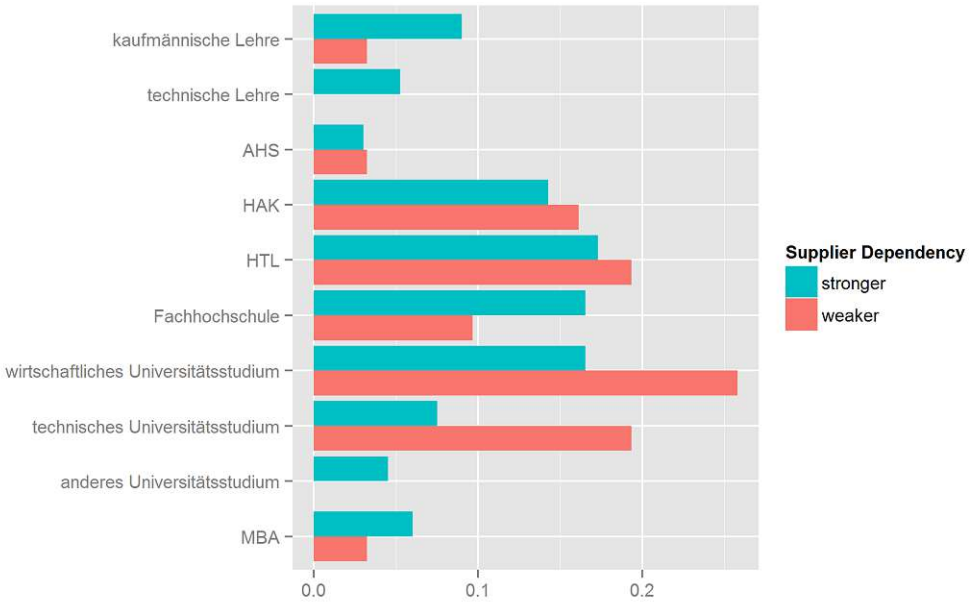

Figure 4.64: Current education of strategic purchasing personnel and supplier dependency

For strategic purchasing professionals, the supplier dependency is a stronger split criteria. Companies with stronger dependency have more employees with the following educations: ”technische Lehre” and ”anderes Universitätsstudium”, while companies with weaker dependency have significantly more graduates from ”HAK”, ”HTL”, ”wirtschaftliches Universitätsstudium” and ”technisches Universitätsstudium”. See figure 4.64 on the previous page and table C.28 on page 220 for further details.

After analyzing the current education differences, now the differences for the required education are analyzed. The first applied criteria is the participant age on the required education of operative purchasing professionals. There one significant difference was found: younger CPOs employ more graduates from a ”AHS” than elder CPOs. See table C.29 on page 221 for further details.

The CPO age shows more influence on the required education of strategic purchasing personnel. Elder CPOs more often require ”HAK” education, than young CPOs and also more often ”HTL” education than middle-aged and young CPOs. On the other side, young CPOs require more often economic university degrees than the other two groups and also more often technical university degrees than elder CPOs. Therefore, younger CPOs tend to require higher education than their elder colleagues. See figure 4.65 and table C.30 on page 223 for further details.

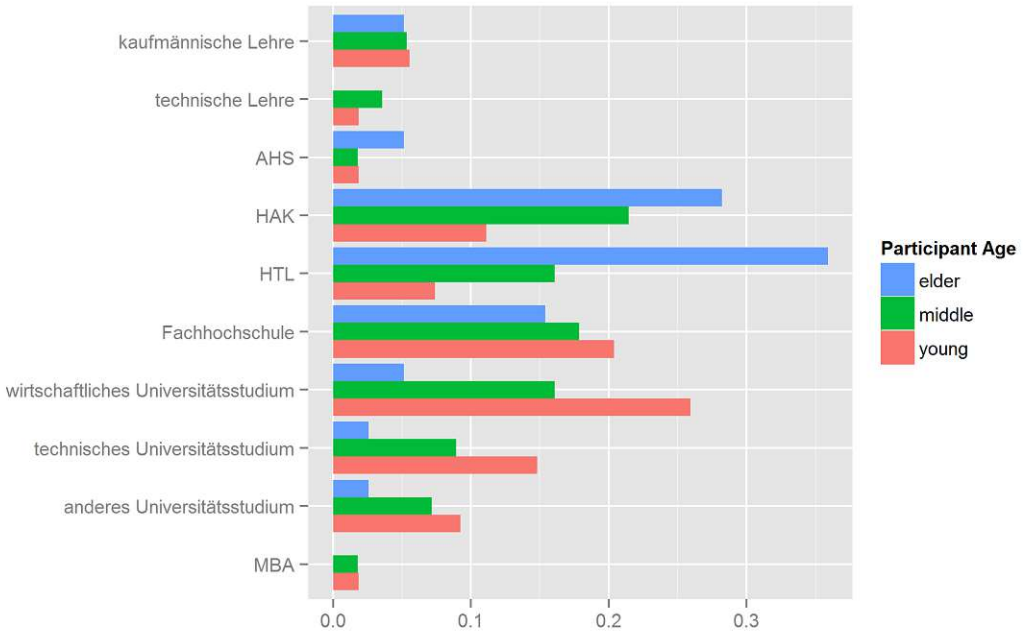

Figure 4.65: Required education of strategic purchasing personnel and participant age

When comparing the CPOs education with their required education for new hires in operative purchasing, one finds again a significant relation. CPOs with apprenticeship tend to require ”kaufmännische Lehre” more often than high school and university graduate CPOs. Also CPOs with high school education require more often ”kaufmännische Lehre” than university graduate CPOs. CPOs, who did an apprenticeship, also favour new hires in operative purchasing with ”technische Lehre” compared to the other two CPO education groups. CPOs with university degree, require more often a ”AHS” degree than CPOs with apprenticeship, and but more infrequently a ”HAK” degree than CPOs with high school education. See figure 4.66 and table C.31 on page 225 for further details.

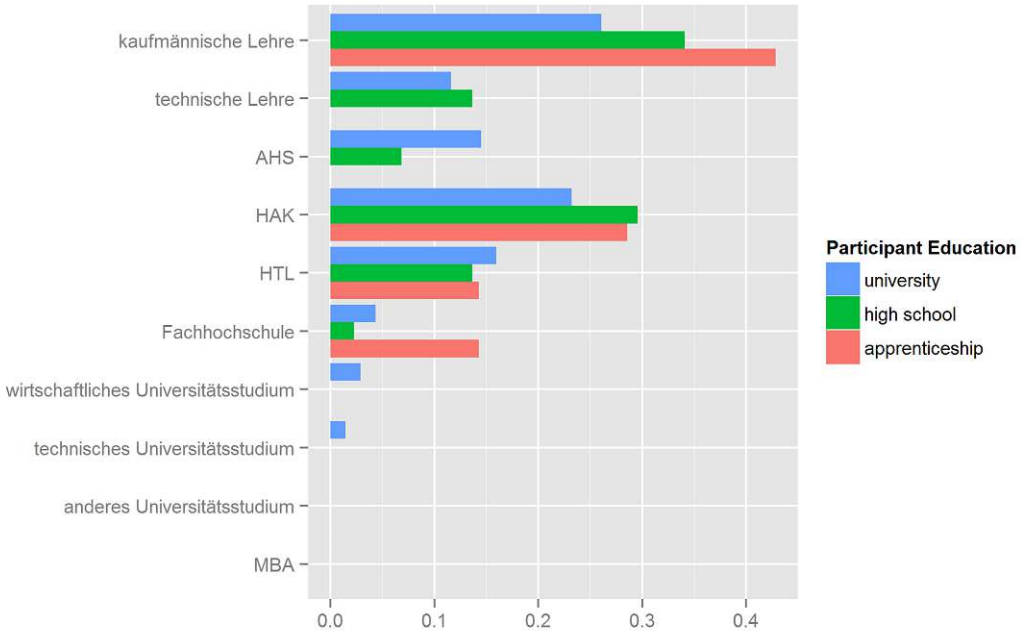

Figure 4.66: Required education of operative purchasing personnel and participant education

Considering the required education for strategic purchasing professionals, again CPOs wtih apprenticeship more often accept ”kaufmännische Leehre” than the other two groups. Also CPOs with high school degree accept a ”HAK” degree more often compared to CPOs with university degree. Finally, CPOs with university degree accept non economic and non technological university degrees more often the CPOs with high school education. See figure 4.67 on the following page and table C.32 on page 226 for further details.

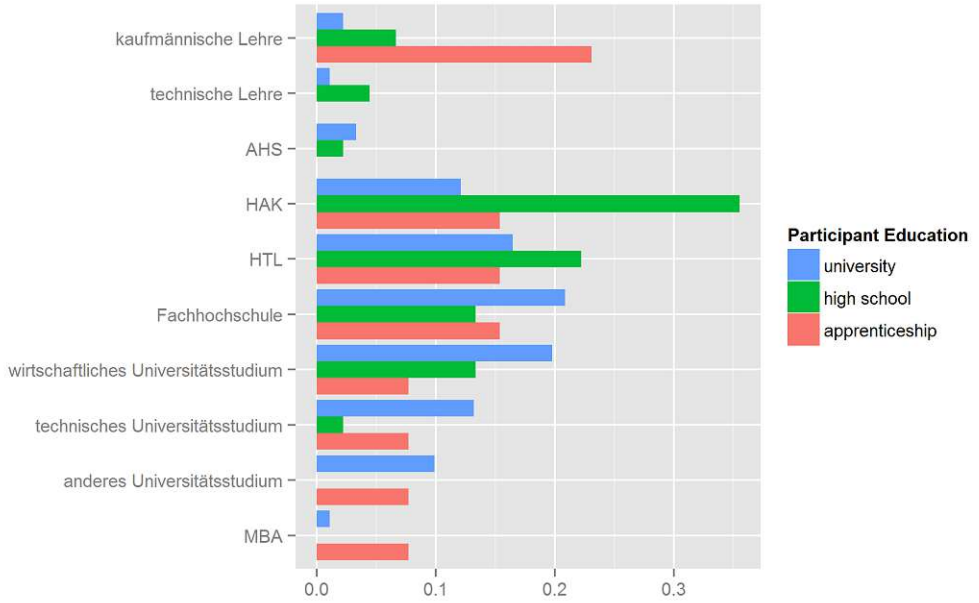

Figure 4.67: Required education of strategic purchasing personnel and participant education

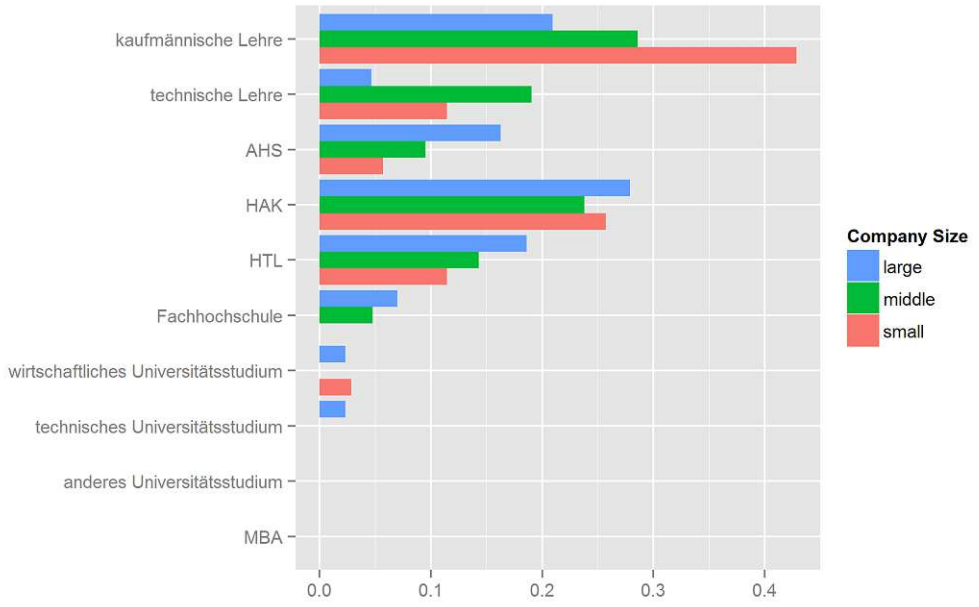

Figure 4.68: Required education of operative purchasing personnel and company size

As shown in figure 4.68 on the facing page, company size reveals only two significant differences in the required education of a operative purchaser, namely small firms more often accept ”kaufmännische Lehre” than large firms and medium firms more often accept ”technische Lehre” than large firms. See table C.33 on page 228 for further details.

In strategic purchasing, company sizes influences the acceptance of ”HAK”, technical and other university degrees. Small companies more often accept ”HAK” education and less often technical or non economic and non technical university degrees than large companies. See figure 4.69 and table C.34 on page 229 for further details.

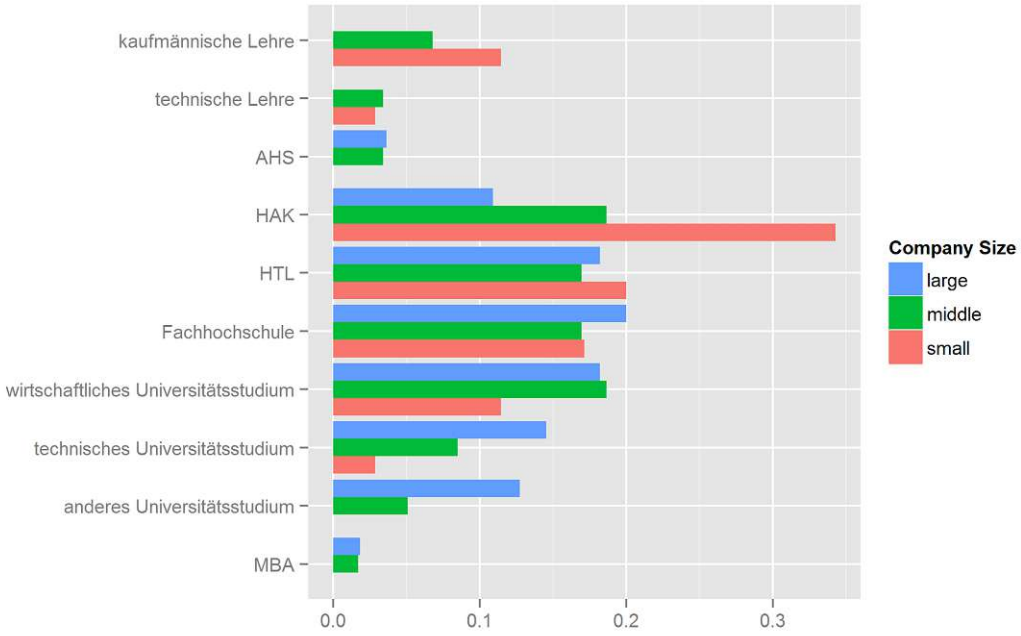

Figure 4.69: Required education of strategic purchasing personnel and company size

Finally, the impact of supplier dependency on the required education is shown. The impact on the accepted education of operative purchasing personnel is significant in only two cases. Less dependent companies more often accept ”kaufmännische Lehre” and ”HAK” than stronger dependent companies. See figure 4.70 and table C.35 on page 230 for further details.

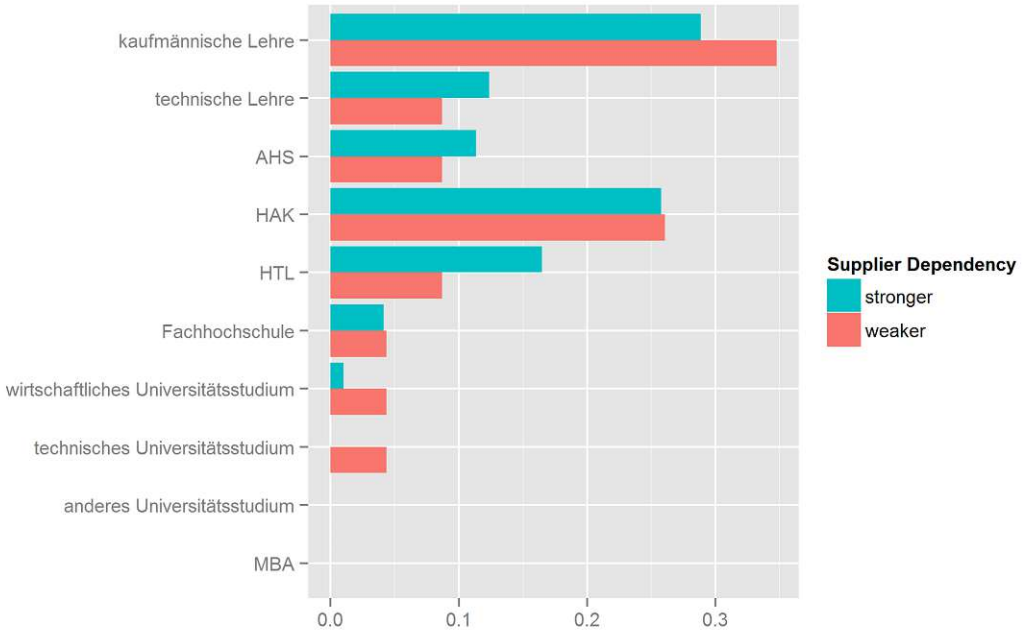

Figure 4.70: Required education of operative purchasing personnel and supplier dependency

As last point for education, the impact on supplier dependency on the required education of strategic purchasing personnel is analyzed. The index reveals four differences. These are: Stronger dependent companies more often require ”technische Lehre’ and weaker dependent companies more often require ”HAK”, ”HTL” and a economic university degree. See figure 4.71 and table C.36 on page 231 for further details.

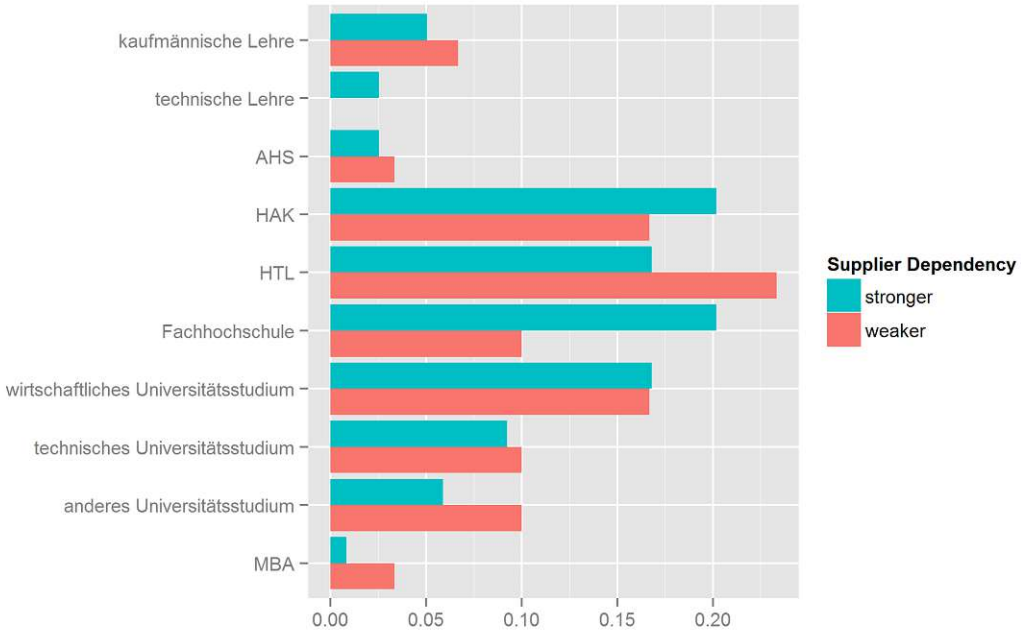

Figure 4.71: Required education of strategic purchasing personnel and supplier dependency

As last, the impact of company size and supplier dependency on the required skill set is analyzed.
The required skills for current purchasing professionals rarely depend on the company size, as it only has significant impact on the importance of two skills. These are conflict management, what large companies rate more important than small companies, and technological know-how, what middle companies rate more important than small companies. See figure 4.72 and table C.37 on page 233 for further details.

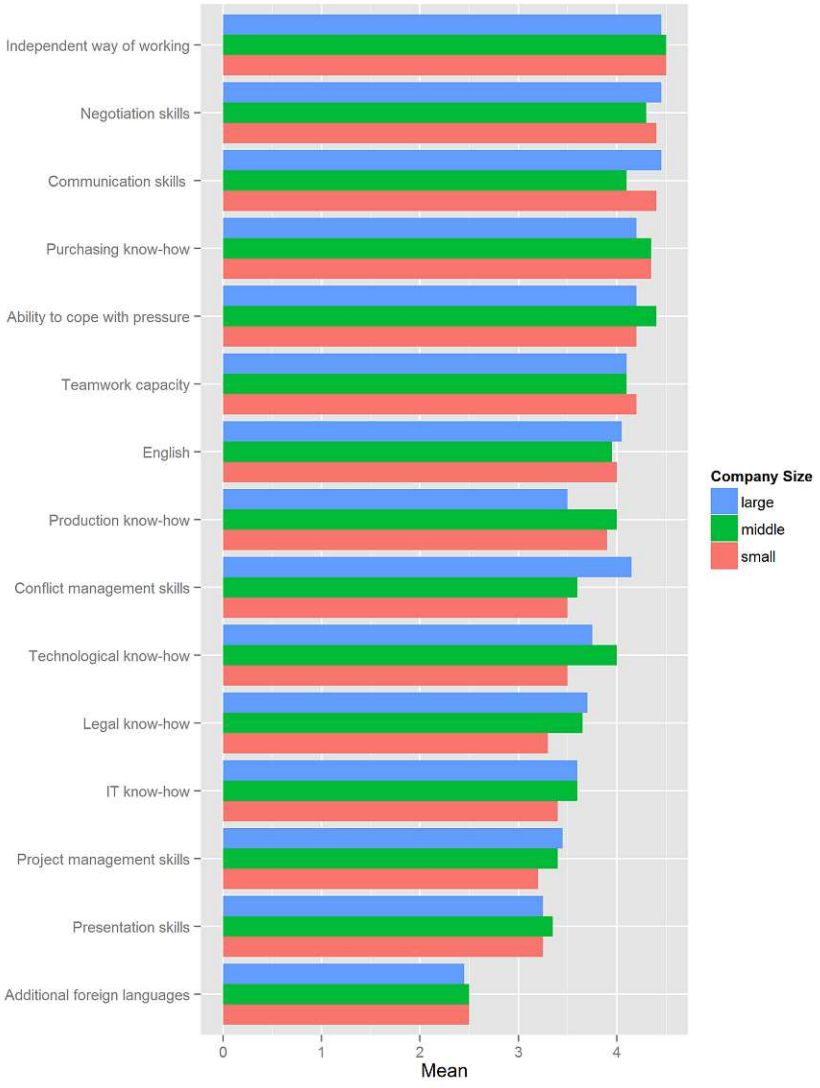

Figure 4.72: Current skills-set and company size

The company size has only one significant impact on the future development of the required skill set, namely medium sized companies expect technological know-how gain more importance than large companies. See figure 4.73 and table C.39 on page 236 for further details.

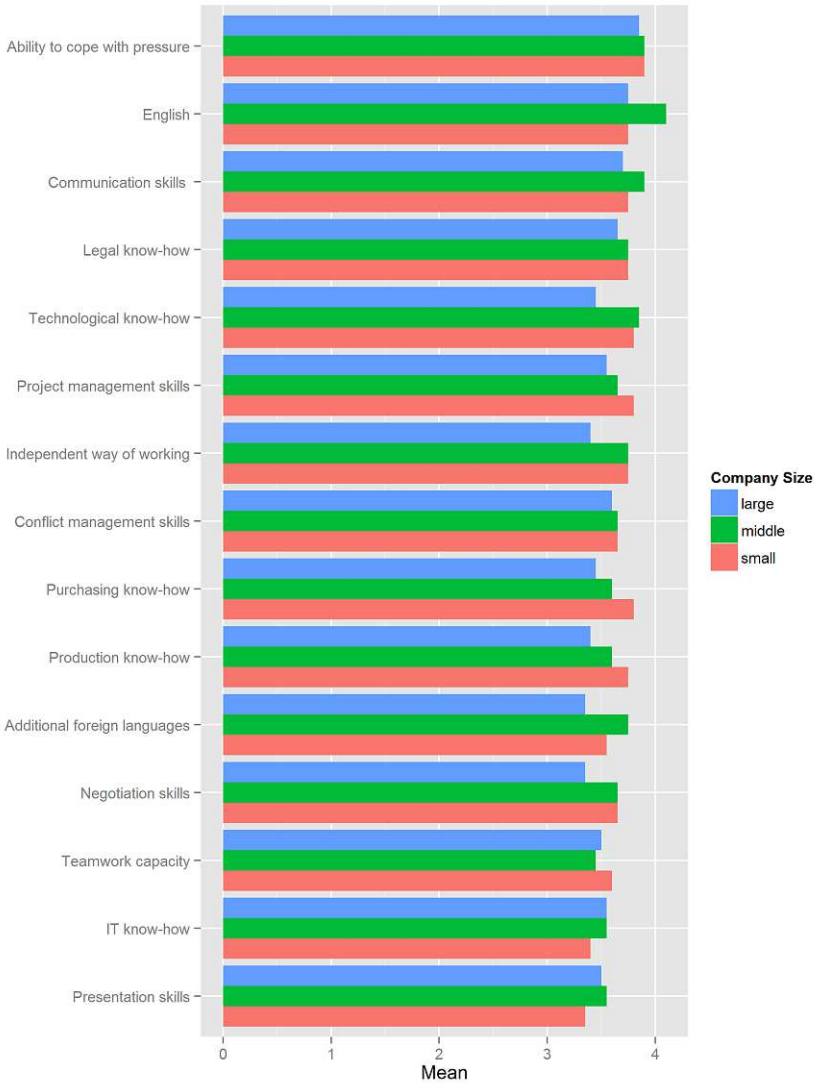

Figure 4.73: Future skills-set and company size

The supplier dependency also only impacts certain skills. For the current importance of the skills, weaker dependent companies rate negotiation skills and additional foreign languages higher than stronger dependent companies. An explanation could be, that less dependent companies more often face negotiations with suppliers and therefore, also require more language skills. See figure 4.74 and table C.38 on page 235 for further details.

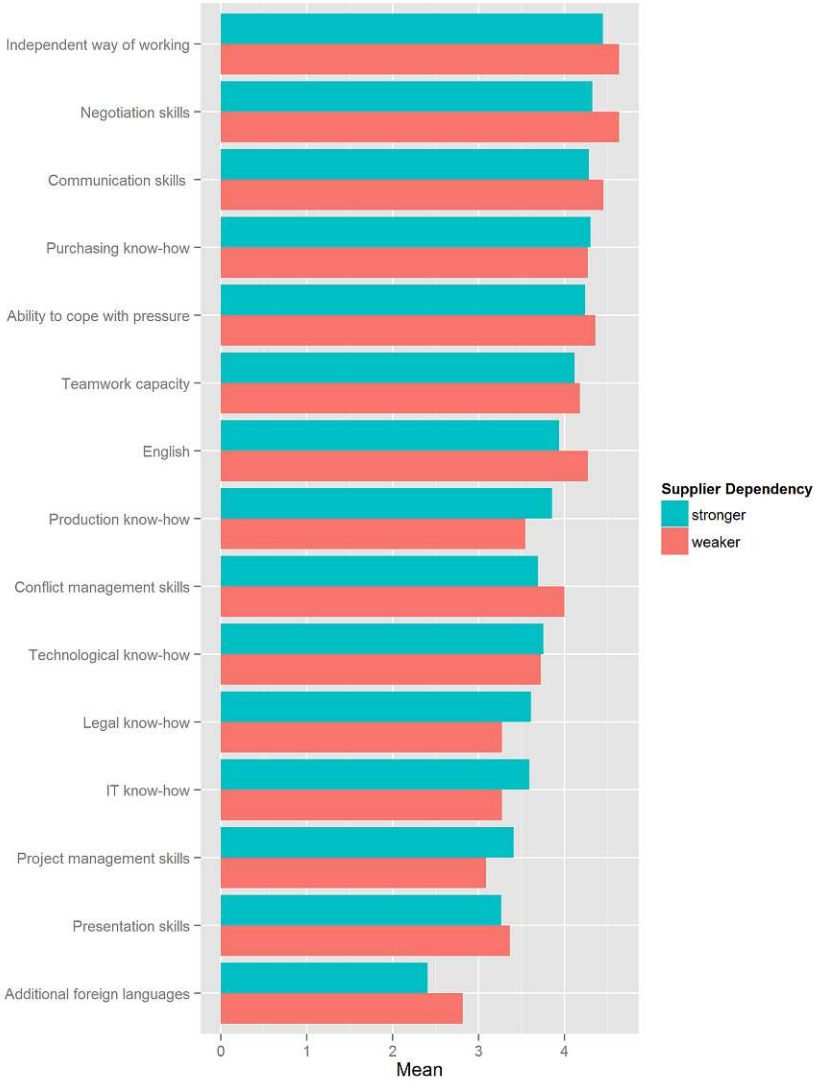

Figure 4.74: Current skills-set and supplier dependency

Last, the supplier dependency has an impact on the future development of the importance of production know-how and additional foreign languages. Less dependent companies expect these two skills to gain stronger in importance than more dependent companies.

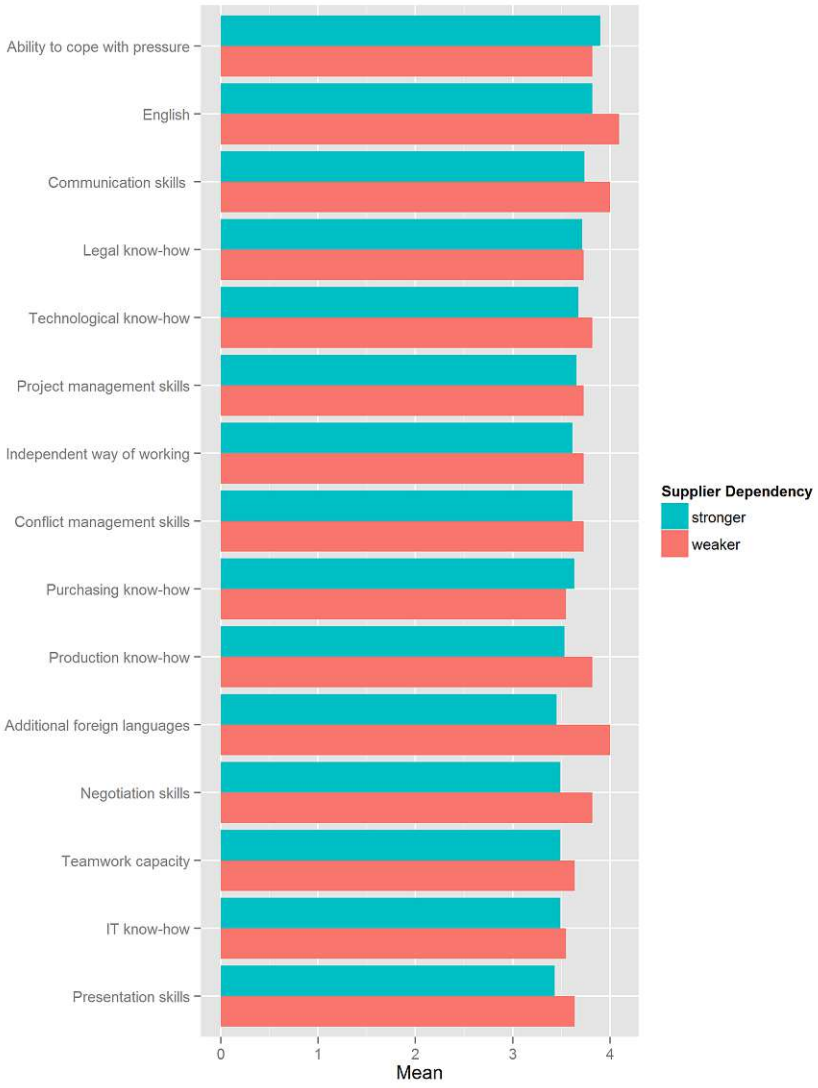

Figure 4.75: Future skills-set and supplier dependency

CHAPTER 5

Conclusion

This thesis aimed at answering the question how the purchasing function will change in the next ten years with regards to purchasing tasks and organization as well as education and skills of purchasing professionals. The main results will be discussed briefly in this chapter whereby the structure will follow the research question:

Tasks What tasks will be important for the purchasing function?
The evaluation of the survey clearly shows that operative tasks are currently considered to be equally or even more important than strategic tasks. This is somewhat surprising as most interviewees emphasized the importance of strategic tasks. However, the survey also shows that strategic tasks will rapidly gain importance while operative tasks are expected to stagnate with regards to their importance for the purchasing function. Tasks such as supplier development, risk management, market analysis, strategy development and participating in R&D processes can be expected to be essential in the future. The relative decline in the importance of operative purchasing tasks might also be due to the trend to automatize operative tasks. While the current importance of tasks seems to be seen relatively controversial, it is interesting to note that there seems to be a general consensus that the tasks the purchasing function has to perform become more complex and difficult in the future.
Moreover, it has to be considered that there is and there will be a significant difference concerning the importance of these tasks with regards to the size of a company and the market it operates in. While smaller companies generally tend to rate supplier development and participation in R&D processes higher than large companies, medium size companies seem to expect tasks such as supplier evaluation or data updating to grow stronger than their smaller or larger peers. Furthermore, there it is worth noting that companies that consider themselves to be highly dependent on their suppliers rate participation in R&D processes significantly more important than their less dependent counter parts. Meanwhile, companies that feature a lower level of supplier dependency expect tasks such as participation in RFQ creation of logistics to grow stronger

than those that are more dependent on suppliers.

Organization How will the purchasing function be organized in ten years?
The results show that cooperating with the manufacturing or production-department is to be considered very important for the purchasing function. Companies of any size consider the interface to the manufacturing department the single most important connection of the purchasing department to another function. However, it is worth noting that there is a considerable difference concerning the way companies of different sizes rate the cooperation with the R&D and legal department. While small companies rate the cooperation with R&D significantly higher than their larger peers, large companies consider the cooperation with the legal department significantly more important than their small and medium sized counterparts. While the link to the manufacturing department can be expected to stay important, the cooperation with the R&D department and the quality department can be expected to grow in relevance in the future.
Quite unsurprisingly, the success of the purchasing function is measured mostly monetary. Only a small number of companies also measure non-monetary indicators to evaluate the success of the purchasing function. While many of the interview partners indicated that the importance of non-monetary performance indicators is increasing, the survey shows that the majority of participants expect the contrary: Monetary indicators for measuring purchasing success can be expected to get even more important while there seems to be no trend to make more extensive use of non-monetary indicators.

Education What eduction will purchasing professionals need in 10 years?
In order to answer the part of the research question, the education of operative and strategic purchasing professionals were analyzed separate. The current status of education of purchasing personnel as well as the required education was analyzed. It was not asked, what education purchasers will need in ten years, as the required education depends on a variety of influence factors, which could not be investigated due to time constraints in the survey. The required education should, however, give an outlook, how the requirements will evolve.
First, for current education the collected data show a clear difference between operative and strategic purchasing personnel. On one side, employees in operative purchasing have an economic background and the most common education is an apprenticeship with economic focus or a high school with economic focus (”HAK”). Only a minority of the employees hold a university degree. However, every level of education is represented in operative purchasing (see figure 4.34 on page 121). The results also suggest, that larger enterprises tend to have higher educated employees in operative purchasing, however, support for this hypothesis was only found for economic apprenticeships, high schools with technical focus and economic university degrees (see figure 4.61 on page 147 and table C.25 on page 217). A systematic relation to supplier dependency was not found for the current education of operative purchasing professionals. On the other side, employees in strategic purchasing have on average a higher education than their colleagues in operative purchasing. Also in contrast to operative purchasing, the education is distributed more equally across economic and technical educations. The most common educations in strategic purchasing are high schools with economic or technical focus, a university of applied

sciences (”FH”) or an economic university. However, again all types of educations are represented and the mean is somewhere between high school and university level. When comparing the education of employees related to company size, again professionals in large companies tend to have higher education than professionals in medium or small companies. Statistical evidence for this trend was found for high school with economic focus (”HAK”), technical university degrees and other university degrees (see figure 4.62 on page 148 and table C.26 on page 218). In relation to supplier dependency, less dependent companies tend to employee higher educated personnel in strategic purchasing. Support for this hypothesis was found for technical apprenticeship, high school with economic and technical focus, and university degrees with technical and economic focus. Other university degrees show a different trend, however the reason could be, that due to now supplier dependent company check this type of education (see figure 4.62 on page 148 and table C.28 on page 220).
Second, the distribution of the required education of operative and strategic purchasing personnel shows a difference in the average education level. On one side, accepted educations in operative purchasing have in the majority an economic background with the largest groups being apprenticeships and high schools both with economic focus. Only very few companies have answered university education for operative purchasing (see figure 4.37 on page 124). In relation to company size or supplier dependency no significant trend was found for required education of operative purchasing professionals. On the other side, the required education for strategic purchasing new hires is on average again higher, than for operative personnel. A focus on a specialization was again not found. For the type of education the participants rated technical and economic focused educations equally. The largest groups are high schools with either economic or technical focus, universities of applied sciences and economic universities. The required education of strategic purchasing professionals shows an interesting relation to the age of the CPO. While younger CPOs more often require university degrees, elder CPOs on average require high school degrees. This trend is statistically supported for high school education with both technical and economic focus as well as for economic university education. In relation to company size, the required education is higher for larger companies. This trend is statistically supported for high school with economic focus and technical and other university (see figure 4.69 on page 153 and table C.34 on page 229). In relation to supplier dependence the required education of strategic purchasers shows no clear trend.
Finally, the general distribution of the required education looks similar to the current education, however, strategic purchaser face a slightly higher required education and operative purchaser a slightly lower required education than they currently have. This also supports the trend of stronger separation of operative and strategic purchasing, with lower education and, therefore, cheaper operative purchasing personnel and higher educated strategic purchasing personnel.

Skills What skills are required to fulfil the task of a purchasing professional in ten years? Therefore, first, the findings for current importance are analyzed and second, the development within the next years is outlined.
The required skills can be split in four groups: first those, which are important and further gain importance above average , second those, which are not important, but will gain importance

above average, third those, which are important, but will not further gain importance and finally those, which are not important and lose importance compared to the other skills (see figure 4.40 on page 127).
The first group of skills, which were found to be very important and even become more important, consists of: ”Ability to cope with pressure”, ”English”, ”Communication Skills”. These three are all rated as important or very important today and are expected to gain importance above average in the next years. All skills are very common and basic for the purchasing function and therefore, they are unsurprisingly part of group one.
The second group of skills, which are less important than average, but are expected to gain importance more than average, consists of: ”Technological know-how”, ”Legal know-how” and ”Project management skills”. The skills within this group represent the shift towards a more strategic and broader function, where purchasing professionals need more technological and legal know-how. Also project management skills suggest, that the purchasing function will become a more important function.
The third group of skills, which are already important, but will remain on their level, consists of: ”Independent way of working”, ”Purchasing know-how”, ”Negotiation skills”, ”Teamwork capacity”. These skills are all classical purchasing skills already required of professionals nowadays. Therefore, no further importance gain is expected in the future. The last group of skills, which are less important than average and will remain or further loose importance, consists of: ”Conflict management”, ”Production know-how”, ”IT know-how”, ”Presentation skills”, ”Additional foreign languages”. However, only the last is expected to loose importance. These are skills not directly relevant for the purchasing function and are therefore not expected to get into focus within the next years. The investigated influence of company size and supplier dependency did not show a trend for current importance or future development of the required skill set, therefore, it is expected that employees in different types of companies need similar skill sets.

There are certainly limitations to the research conducted for this thesis:
While the size of the sample of the survey (60 participants) is large enough to provide statistically significant results for some questions, it is certainly too small to find significant relations between data of a more segmented nature. It would be especially interesting to find industry specific trends, however, the sample size and data quality with regards to industries and sectors which does not allow it. Moreover, the range of available industries to choose from for the study participants has emerged not to be extensive enough as the range did not cover all relevant industries. It will be the task of future research projects to address these limitations.
Moreover, it is necessary to acknowledge that all companies that participated in the survey are Austrian companies which somewhat limits the relevance of the study due to the structure of the Austrian economy which is characterized by small and medium sized companies. Additionally, even considering the structure of the Austrian economy, the vast majority of participants are companies of a relatively moderate size. Therefore, the results might not be directly transferable to multinational corporation.
Moreover, it has to be taken into account that all participating companies are member companies of the BMÖ and can therefore be considered to already being sensitized to the topics researched in this thesis. As the share of companies that have not yet thought about these questions can

be considered higher among companies that are not part of the BMÖ network, there might be a small bias among the study participants.

The purchasing function is subject to a considerable amount of research, however, there is a lot more to be discovered. The first possibility to further elaborate the topic is to collect data with respect to the named limitations, in order to validate the findings of this thesis. Another area for possible future research are in-depth analysis that focus on specific issues such as purchasing organization, tasks or education. While this thesis gives a general outline of the development within the next years, one could specifically investigate the future development of tasks for example and collect more explaining variables. Further, the tasks could be linked with skills, to develop of framework for skill requirements depending on the evolution of tasks within the purchasing function. Finally, this thesis has a focus on the internal perception of the purchasing function, future research could compare this internal perception to the external perception of the function. Finally, future research could link trends in the development of the purchasing function with external social influence factors like increasing transportation infrastructure or decreasing barriers for international trade and gain a broader picture of the function.

To conclude, it can be said that the research questions have been answered and the purpose of the thesis has been fulfilled. The results of this thesis have implications that go far beyond the academic world and are highly relevant for purchasing managers across all major industries. The hypothesis that the responsibilities and tasks of purchasing employees are increasing has been validated, as has the hypothesis that education requirements are on the rise. In general, the purchasing function can be expected to evolve to a function of high strategic importance, a key interface between suppliers and internal stakeholders. It is the task of the purchasing managers to adapt their organizations in a way that allows their employees to cope with this new challenges. There can be no doubt that recruiting and keeping the best people for the purchasing function is one key to successfully manage this transition.

List of Figures

List of Tables

Bibliography

[1] http://www.infineon.com/cms/en/corporate/company/procurement-logistics/doing-business-with-infineon-technologies/supplier-management.html, opened july 23 2014.

[2] Interview 01. Transcription of the first interview. Vienna, 25.01.2014.

[3] Interview 02. Transcription of the second interview. Graz, 27.02.2014.

[4] Interview 03. Transcription of the third interview. Vienna, 19.02.2014.

[5] Interview 04. Transcription of the fourth interview. Vienna, 14.02.2014.

[6] Interview 05. Transcription of the fifth interview. Vienna, 27.01.2014.

[7] Interview 06. Transcription of the sixth interview. Vienna, 18.02.2014.

[8] Interview 07. Transcription of the seventh interview. Linz, 10.03.2014.

[9] Interview 08. Transcription of the eighth interview. Vienna, 26.02.2014.

[10] Interview 09. Transcription of the nineth interview. Vienna, 4.03.2014.

[11] Interview 10. Transcription of the tenth interview. Vienna, 5.02.2014.

[12] Interview 11. Transcription of the eleventh interview. Vienna, 7.02.2014.

[13] Interview 12. Transcription of the twelfth interview. Vienna, 24.02.2014.

[14] Interview 13. Transcription of the thirteenth interview. Wels, 12.02.2014.

[15] Interview 14. Transcription of the fourteenth interview. Wels, 10.03.2014.

[16] Interview 15. Transcription of the fifteenth interview. Wels, 10.03.2014.

[17] Ronald Bogaschewsky. Analyse und auswahl ausländischer beschaffungsmärkte: Konzepte und methoden. *Zentes, J., Morschett, D., Schramm-Klein, H.: Außenhandel, Wiesbaden*, pages 679–698, 2004.

[18] Laura E Cánez, Ken W Platts, and David R Probert. Developing a framework for make-or-buy decisions. *International Journal of Operations & Production Management*, 20 (11):1313–1330, 2000.

[19] Amelia S Carr and Larry R Smeltzer. An empirically based operational definition of strategic purchasing. *European Journal of Purchasing & Supply Management*, 3(4):199–207, 1997.

[20] Thomas Y Choi and Janet L Hartley. An exploration of supplier selection practices across the supply chain. *Journal of operations management*, 14(4):333–343, 1996.

[21] Martin Christopher. Logistics and supply chain management: strategies for reducing cost and improving service. london. *Financial times*, 1998.

[22] Ronald H Coase. The nature of the firm. *economica*, 4(16):386–405, 1937.

[23] Paul D Cousins, Benn Lawson, and Brian Squire. An empirical taxonomy of purchasing functions. *International Journal of Operations & Production Management*, 26(7):775–794, 2006.

[24] Andrew Cox, Dan Chicksand, and Paul Ireland. Overcoming demand management problems: The scope for improving reactive and proactive supply management in the uk health service. *Journal of public procurement*, 5(1), 2005.

[25] Lowell E Crow and Jay D Lindquist. Impact of organizational and buyer characteristics on the buying center. *Industrial Marketing Management*, 14(1):49–58, 1985.

[26] Kofi Q Dadzie, Wesley J Johnston, Evelyn W Dadzie, and Bonghee Yoo. Influence in the organizational buying center and logistics automation technology adoption. *Journal of Business & Industrial Marketing*, 14(5/6):433–444, 1999.

[27] Ajay Das, Ram Narasimhan, and Srinivas Talluri. Supplier integration—finding an optimal configuration. *Journal of Operations Management*, 24(5):563–582, 2006.

[28] Antonio Davila, Mahendra Gupta, and Richard Palmer. Moving procurement systems to the internet:: the adoption and use of e-procurement technology models. *European Management Journal*, 21(1):11–23, 2003.

[29] Luitzen de Boer. *Operations research in support of purchasing: design of a toolbox for supplier selection*. 1998.

[30] Nicola Dimitri, Federico Dini, and Gustavo Piga. 3 when should procurement be centralized? *Handbook of procurement*, 2006.

[31] Simon Domberger. *The Contracting Organization: A Strategic Guide to Outsourcing: A Strategic Guide to Outsourcing*. Oxford University Press, 1998.

[32] Kevin Dunn and Iain Hay. *Qualitative research methods in human geography*. Oxford: Oxford University Press, 2005.

[33] Lisa M Ellram and Amelia Carr. Strategic purchasing: a history and review of the literature. *International Journal of Purchasing and Materials Management*, 30(1):9–19, 1994.

[34] Wilfred J Ethier. Globalization, globalisation: trade, technology, and wages. *International Review of Economics & Finance*, 14(3):237–258, 2005.

[35] Kai Dominik Foerstl, Evi Hartmann, Finn Wynstra, and Roger Moser. Cross-functional integration and functional coordination in purchasing and supply management: Antecedents and effects on purchasing and firm performance. *International Journal of Operations & Production Management*, 33(6):4–4, 2013.

[36] REFA Verband für Arbeitsstudien. Betriebsorganisation: Methodenlehre der betriebsorganisation. *Planung und Gestaltung komplexer Produktionssysteme. München: Hanser*, 1987.

[37] M José Garrido-Samaniego and Jesús Gutiérrez-Cillán. Determinants of influence and participation in the buying center. an analysis of spanish industrial companies. *Journal of Business & Industrial Marketing*, 19(5):320–336, 2004.

[38] Larry Giunipero, Robert B Handfield, and Reham Eltantawy. Supply management's evolution: key skill sets for the supply manager of the future. *International Journal of Operations & Production Management*, 26(7):822–844, 2006.

[39] Larry C Giunipero and Reham Aly Eltantawy. Securing the upstream supply chain: a risk management approach. *International Journal of Physical Distribution & Logistics Management*, 34(9):698–713, 2004.

[40] Larry C Giunipero and Dawn H Pearcy. World-class purchasing skills: An empirical investigation. *Journal of Supply Chain Management*, 36(4):4–13, 2000.

[41] Larry C Giunipero, Diane Denslow, and Reham Eltantawy. Purchasing/supply chain management flexibility: moving to an entrepreneurial skill set. *Industrial Marketing Management*, 34(6):602–613, 2005.

[42] Larry Carl Giunipero and Robert B Handfield. *Purchasing Education and Training II*. CAPS Research, 2004.

[43] Hans-Jürgen Glinka. Interview, 2003]: Das narrative interview-eine einführung für sozialpädagogen, 2. aufl., juventa. 2003.

[44] Jörn Große-Wilde. Srm—supplier-relationship-management. *Wirtschaftsinformatik*, 46 (1):61–63, 2004.

[45] Gary Hamel and CK Prahalad. Competing for the future: Breakthrough strategies for seizing control of your industry and creating the markets of tomorrow. 1994.

[46] Robert B Handfield, Gary L Ragatz, Kenneth J Petersen, and Robert M Monczka. Involving suppliers in new product development. *California management review*, 42(1), 1999.

[47] Mel Horwitch and Raymond A Thietart. The effect of business interdependencies on product r&d-intensive business performance. *Management Science*, 33(2):178–197, 1987.

[48] Samuel H Huang and Harshal Keskar. Comprehensive and configurable metrics for supplier selection. *International Journal of Production Economics*, 105(2):510–523, 2007.

[49] Paul Humphreys, Ronan McIvor, and Eddie McAleer. The purchasing function as a professional service firm: implications for training and development. *Journal of European Industrial Training*, 22(1):3–11, 1998.

[50] Christopher Jahns, Evi Hartmann, and Lydia Bals. Offshoring: dimensions and diffusion of a new business concept. *Journal of Purchasing and Supply Management*, 12(4):218–231, 2006.

[51] Jonni Jahnukainen and Mika Lahti. Efficient purchasing in make-to-order supply chains. *International journal of production economics*, 59(1):103–111, 1999.

[52] Rajshekhar Raj G Javalgi, Ashutosh Dixit, and Robert F Scherer. Outsourcing to emerging markets: theoretical perspectives and policy implications. *Journal of International Management*, 15(2):156–168, 2009.

[53] Wesley J Johnston and Thomas V Bonoma. The buying center: Structure and interaction patterns. *Journal of Marketing*, 45(3), 1981.

[54] Sandra Jovchelovitch and Martin W Bauer. Narrative interviewing. *Qualitative researching with text, image and sound*, pages 57–74, 2000.

[55] Katri Karjalainen and EM van Raaij. An empirical test of contributing factors to different forms of maverick buying. *Journal of Purchasing and Supply Management*, 17(3):185–197, 2011.

[56] AT Kearney. Creating value through strategic supply management. *Assessment of Excellence in Procurement*, 2004.

[57] William J Kolarik. *Creating quality: concepts, systems, strategies, and tools*. McGraw-Hill New York, 1995.

[58] Michael G Kolchin and Larry Carl Giunipero. Purchasing education and training: Requirements and resources. 1993.

[59] Peter Kraljic. Purchasing must become supply management. *Harvard business review*, 61(5):109–117, 1983.

[60] Daniel R Krause, Robert B Handfield, and Thomas V Scannell. An empirical investigation of supplier development: reactive and strategic processes. *Journal of Operations Management*, 17(1):39–58, 1998.

[61] V Krishnan and Shantanu Bhattacharya. Technology selection and commitment in new product development: The role of uncertainty and design flexibility. *Management Science*, 48(3):313–327, 2002.

[62] Jon A Krosnick. Survey research. *Annual review of psychology*, 50(1):537–567, 1999.

[63] Susan L Kulp, Taylor Randall, Gregg Brandyberry, and Kevin Potts. Using organizational control mechanisms to enhance procurement efficiency: how glaxosmithkline improved the effectiveness of e-procurement. *Interfaces*, 36(3):209–219, 2006.

[64] Richard Lamming. *Beyond partnership: strategies for innovation and lean supply*, volume 94. Prentice Hall London, 1993.

[65] Fred Lemke, Keith Goffin, Marek Szwejczewski, Rolf Pfeiffer, and Bertram Lohmüller. Supplier base management: experiences from the uk and germany. *International Journal of Logistics Management, The*, 11(2):45–58, 2000.

[66] Gary L Lilien and M Anthony Wong. An exploratory investigation of the structure of the buying center in the metalworking industry. *Journal of marketing research*, pages 1–11, 1984.

[67] Urban Ljungquist. Specification of core competence and associated components: a proposed model and a case illustration. *European Business Review*, 20(1):73–90, 2008.

[68] Robyn Longhurst. Semi-structured interviews and focus groups. *Key methods in geography*, pages 117–132, 2003.

[69] Chris Lonsdale and Glyn Watson. The internal client relationship, demand management and value for money: a conceptual model. *journal of Purchasing and Supply Management*, 11(4):159–171, 2005.

[70] David H Maister. Balancing the professional service firm. *Sloan Management Review*, 24(1):15–29, 1982.

[71] Ila Manuj and John T Mentzer. Global supply chain risk management strategies. *International Journal of Physical Distribution & Logistics Management*, 38(3):192–223, 2008.

[72] Philipp Mayring. Qualitative content analysis. In *Forum: Qualitative social research*, volume 1, 2000.

[73] Christopher McDermott and Robert Handfield. Concurrent development and strategic outsourcing: do the rules change in breakthrough innovation? *The Journal of High Technology Management Research*, 11(1):35–57, 2000.

[74] Ronan T McIvor, Paul K Humphreys, and W Eddie McAleer. A strategic model for the formulation of an effective make or buy decision. *Management Decision*, 35(2):169–178, 1997.

[75] Lisa Melander and Nicolette Lakemond. Sourcing technology from suppliers in new product development–purchasing's role as a trouble shooter. In *IPSERA 2012. Confenrence Proceedings. Purchasing & Supply Management in a Changing World, 1-4 Aril 2012 Nales Italy*, 2012.

[76] Robert M Monczka and Larry C Giunipero. International purchaasing: characteristics and implementation. *The International Executive*, 27(1):11–12, 1985.

[77] Robert M Monczka and Robert J Trent. Global sourcing: a development approach. *International Journal of Purchasing and Materials Management*, 27(2):2–8, 1991.

[78] Guido Nassimbeni. International sourcing: Empirical evidence from a sample of italian firms. *International Journal of Production Economics*, 103(2):694–706, 2006.

[79] Robert Neumann, Gerhard Graf, Waltraud Grillitsch, and Alexandra Stingl. Km contributions for the realisation of shared services: The lead-buyer concept. In *Proceedings of the 2nd International Conference on Intellectual Capital, Knowledge Management and Organisational Learning (ICICKM 2005)*, page 345. Academic Conferences Limited, 2005.

[80] Joongsan Oh and Seung-Kyu Rhee. Influences of supplier capabilities and collaboration in new car development on competitive advantage of carmakers. *Management Decision*, 48(5):756–774, 2010.

[81] Charles O'Neal. Concurrent engineering with early supplier involvement: a crossfunctional challenge. *Journal of Supply Chain Management*, 29(2):2–9, 1993.

[82] Thorsten Pehl and Thorsten Dressing. *Praxisbuch Interview, Transkription und Analyse. Anleitungen und Regelsysteme für qualitativ Forschende.* Weinheim: Beltz, 2013.

[83] K W Platts and D R . Developing a framework for make-or-buy decisions. *International Journal of Operations & Production Management*, 20(2000):1313–1330, 2005.

[84] Michael E Porter. *How competitive forces shape strategy*. Harvard Business Review, 1979.

[85] Michael E Porter. What is strategy? *Published November*, 1996.

[86] Anshuman Prasad and Pushkala Prasad. Moving out: Toward understanding the complexity of outsourcing in the age of globalization. *Business Renaissance Quarterly*, 2(3), 2007.

[87] William D Presutti Jr. Supply management and e-procurement: creating value added in the supply chain. *Industrial marketing management*, 32(3):219–226, 2003.

[88] D R Probert. The practical development of a make or buy strategy: the issue of process positioning D.R. *Integrated Manufacturing Systems*, 7(2):44–51, 2005.

[89] Gioconda Quesada, Marvin E González, James Mueller, and Rene Mueller. Impact of e-procurement on procurement practices and performance. *Benchmarking: An International Journal*, 17(4):516–538, 2010.

[90] Gary L Ragatz, Robert B Handfield, and Thomas V Scannell. Success factors for integrating suppliers into new product development. *Journal of product innovation management*, 14(3):190–202, 1997.

[91] Gary L Ragatz, Robert B Handfield, and Kenneth J Petersen. Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, 55(5):389–400, 2002.

[92] Jochen Ruf. Das lead buyer konzept. 2005.

[93] Holger Schiele. Early supplier integration: the dual role of purchasing in new product development. *R&d Management*, 40(2):138–153, 2010.

[94] Lena Schneider and Carl Marcus Wallenburg. 50 years of research on organizing the purchasing function: Do we need any more? *Journal of Purchasing and Supply Management*, 19(3):144–164, 2013.

[95] Jan Aart Scholte. *Globalization: A critical introduction*. Palgrave Macmillan, 2005.

[96] Christian Schuh, Robert Kromoser, Michael F Strohmer, Ramón Romero Pérez, and Alenka Triplat. *The Purchasing Chessboard*^{TM}. Springer, 2009.

[97] Ing Dipl-Wirt Ing Günther Schuh, Dipl-Wirt Ing Daniel Bremer, Dipl-Ing Toni Drescher, and Dipl-Ing Jennifer Essig. Beschaffungsmarktforschung. In *Einkaufsmanagement*, pages 147–181. Springer, 2014.

[98] DV Smith, BG Lowe, DH Lyons, and WH Old. The development project committee on standards for vendor evaluation. *National Association of Purchasing Agents, New York, NY*, 1963.

[99] Robert E Spekman and Louis W Stern. Environmental uncertainty and buying group structure: An empirical investigation. *Journal of Marketing*, 43(2), 1979.

[100] Robert E Spekman, John W Kamauff, and Deborah J Salmond. At last purchasing is becoming strategic. *Long Range Planning*, 27(2):76–84, 1994.

[101] Katharina J Srnka and Sabine T Koeszegi. From words to numbers: How to transform qualitative data into meaningful quantitative results. *Schmalenbach Business Review (SBR)*, 59(1), 2007.

[102] Martin Stack and Ricard Downing. Another look at offshoring: Which jobs are at risk and why? *Business Horizons*, 48(6):513–523, 2005.

[103] John Stevens. *Measuring purchasing performance*. Business books, 1978.

[104] Ravi Venkatesan. Strategic sourcing: to make or not to make. *Harvard Business Review*, 70(6):98–107, 1992.

[105] Stephan M Wagner. Supplier development practices: an exploratory study. *European journal of marketing*, 40(5/6):554–571, 2006.

[106] Charles A Watts and Chan K Hahn. Supplier development programs: an empirical analysis. *Journal of Supply Chain Management*, 29(2):10–17, 1993.

[107] Frederick E Webster Jr and Yoram Wind. A general model for understanding organizational buying behavior. *Journal of marketing*, 36(2), 1972.

[108] Elizabeth J Wilson. The relative importance of supplier selection criteria: a review and update. *International Journal of Purchasing and Materials Management*, 30(2):34–41, 1994.

[109] J Womack, Daniel T Jones, and Daniel Roos. The machine that changed the world: Based on the massachusetts institute of technology $5million5 - yearstudyonthefutureoftheautomobile.New\ York,\ Rawson$, 1990.

[110] Finn Wynstra, Mathieu Weggeman, and Arjan Van Weele. Exploring purchasing integration in product development. *Industrial Marketing Management*, 32(1):69–83, 2003.

[111] George A Zsidisin, Lisa M Ellram, Joseph R Carter, and Joseph L Cavinato. An analysis of supply risk assessment techniques. *International Journal of Physical Distribution & Logistics Management*, 34(5):397–413, 2004.

APPENDIX A

Interview guideline

Interview Leitfaden - Procurement 2025

- Unternehmensdaten:
  - Wie groß ist Ihr Unternehmen? (Angestellte/Umsatz/Bilanzsumme, international tätig/welche Regionen)
  - Wie hoch ist das Einkaufsvolumen?
  - Wie viele Mitarbeiter sind im Einkauf beschäftigt?

- Aufgaben des Einkaufs
  - Welche Aufgaben hat der Einkauf in Ihrem Unternehmen?
  - Bitte bewerten Sie die genannten Aufgaben, welche sind operativer, welche sind strategischer Natur?
  - Wie verändern sich die genannten Aufgaben und was bedeutet das für den Einkauf?

- Organisation des Einkaufs
  - Welchen Stellenwert haben die Aufgaben des Einkaufs gegenüber anderen Aufgaben im Unternehmen? / Welche Priorität wird dem Einkauf in Ihrem Unternehmen beigemessen?
  - Was ist der Beitrag des Einkaufs zum Unternehmenserfolg und wie wird der Beitrag gemessen?
  - Wie ist der Einkauf in Ihrer Unternehmensstruktur eingebettet? (Organigramm)
  - Spiegelt diese Struktur die tatsächliche Priorität des Einkaufs in Ihrem Unternehmen wieder?
  - Wie ist die Funktion des Einkaufs in Ihrem Unternehmen strukturiert? Welche Stellen gibt es?
  - Ist Ihr Einkauf eher zentral oder dezentral organisiert und wie verändert sich die Verteilung?

- Einkaufsprozess
  - Welche Funktionsbereiche sind in Ihrem Unternehmen relevant für den Einkaufsprozess?
  - Welches Knowhow bringt der Einkauf im Gesamtunternehmen ein?
  - Welches Wissen bringen die anderen Funktionen in den Einkaufsprozess ein?
  - Ist der Einkauf in Ihrem Unternehmen in Forschungs- und Entwicklungsprozesse eingebunden?
  - Ist der Einkauf in Ihrem Unternehmen in den Produktentwicklungsprozess eingebunden? Wenn ja: Ab welcher Stufe des Produktentwicklungsprozesses?
  - Welche Bedeutung wird dem Thema Risikomanagement im Einkauf beigemessen?
  - Welche Bedeutung wird dem Thema Compliance im Einkauf beigemessen? Welche Maßnahmen gibt es, um sicherzustellen, dass Compliance-Richtlinien eingehalten werden?
  - Wie hoch ist in Ihrem Unternehmen der Anteil an nicht vom Einkauf bedienten Beschaffungen, Stichwort "maverick buying"?
  - Warum werden diese Produkte nicht vom Einkauf gekauft? Welche Produkte sind dies? Wie hoch ist der Anteil am Einkaufsvolumen dieser Produkte?
  - Gibt es Maßnahmen um hier Gegenzusteuern?

Figure A.1: Interview guideline, page one

- Qualifikationen/Fähigkeiten/Weiterbildung
  - Welche Qualifikation haben die Einkäufer in Ihrem Unternehmen? Akademiker? Falls ja, welche Universität und welches Studium?
  - Glauben Sie, die Ausbildung für Einkäufer wird sich verändern und falls ja, in welche Richtung?
  - Welche Qualifikation benötigen Einkäufer in Ihrem Unternehmen?
  - Welche Fähigkeiten benötigen Einkäufer in Ihrem Unternehmen?
  - Wo kann Fähigkeit xy (vom Befragten genannte) erworben werden?
  - Wie funktioniert die Aus- und Weiterbildung für Einkäufer in Ihrem Unternehmen? Haben Sie eine interne oder externe Aus- und Weiterbildung? Falls extern, bei welchem Institut lassen Sie Ihre Mitarbeiter ausbilden?
  - Wie beurteilen Sie die Karrierechancen im Einkauf in Ihrem Unternehmen?
  - Wie hoch schätzen Sie den Anteil Ihrer Einkaufsmitarbeiter ein, die sich in erster Linie mit operative Aufgaben beschäftigen und wie viele beschäftigen sich mit strategischen Aufgaben? Verändert sich diese Verteilung?

- Geschlechtergleichberechtigung
  - Wie hoch ist der Frauenanteil im Einkauf in Ihrem Unternehmen?
  - Wird dem Thema Gleichberechtigung in Ihrem Unternehmen hohe Bedeutung zugemessen?
  - Haben Sie Förderprogramme für Frauen im Einkauf?
  - Ist die Verteilung für Sie in Ordnung?

- Zulieferer: Integration und Informationsaustausch
  - Wie funktioniert der Informationsaustausch mit den Zulieferern? Welche Technologien werden dabei verwendet?
  - Ab welcher Produktentwicklungsstufe nehmen Zulieferer am Informationsaustausch teil?

- Rahmenbedingungen
  - Welche Technologien haben Einfluss auf die Entwicklung des Einkaufs in Ihrem Unternehmen und welche Vor- und Nachteil sind mit der jeweiligen Technologie verbunden?
  - Wie verändert sich das Marktumfeld? Haben diese Veränderungen Einfluss auf den Einkauf und falls ja, welche?
  - Verändert die Öffnung neuer Märkte die Rolle des Einkaufs? Falls ja, was bedeutet das für die benötigten Fähigkeiten?

- Abschlussfrage:
  - Wie würden Sie den Einkauf in 10 Jahren gestalten, falls Sie dies allein entscheiden könnten? Welche Ressourcen würden sie dazu benötigen? Wie wäre der Einkauf organisiert? Welche Mitarbeiter mit welchen Fähigkeiten?
  - Welche Themen halten Sie noch für relevant für die weitere Entwicklung des Einkaufs?

Figure A.2: Interview guideline, page two

APPENDIX B

Survey

Einkauf 2025

p1_q1_Persnliche_Angaben
Persönliche Angaben

1.1
Geschlecht *
- ○ Männlich
- ○ Weiblich
- ○ keine Angabe

1.2
Alter in Jahren *

1.3
Höchste abgeschlossene Ausbildung *
- ○ kaufmännische Lehre
- ○ technische Lehre
- ○ AHS
- ○ HAK
- ○ HTL
- ○ Fachhochschule
- ○ wirtschaftliches Universitätsstudium
- ○ technisches Universitätsstudium
- ○ anderes Universitätsstudium
- ○ MBA
- ○ andere

1.4
Ihre Position im Unternehmen: *
- ○ Mitarbeiter im operativen Einkauf
- ○ Mitarbeiter im strategischen Einkauf
- ○ Leitungsfunktion im Einkauf (Category Manager etc.)
- ○ Einkaufsleiter
- ○ Senior Management
- ○ andere

1.5
Einkaufserfahrung in Jahren *

1.6
Von Ihnen verantwortetes Einkaufsvolumen (Mio. EUR / Jahr) *

Figure B.1: Survey questionnaire, page one

p2_q1_Unternehmensbezogene_Angaben

Unternehmensbezogene Angaben

2.1

Branche Ihres Unternehmens *

Mehrfachauswahl möglich

- ☐ Anlagenbau
- ☐ Chemie
- ☐ Prozessindustrie
- ☐ Telekommunikation und Elektronik
- ☐ IT
- ☐ Automotive
- ☐ Konsumgüter und Lebensmittel
- ☐ andere

p2_q3_Unternehmensdaten

Unternehmensdaten *

Bitte geben Sie eine Schätzung an, falls nicht genau bekannt

Mitarbeiter gesamt	
Mitarbeiter im gesamten Einkauf	
Mitarbeiter im operativen Einkauf	
Mitarbeiter im strategischen Einkauf	
Umsatz [Mio. EUR]	
Einkaufsvolumen [Mio. EUR]	

p2_q4_Fertigungsarten_in_Ihrem_Unternehmen

Fertigungsarten in Ihrem Unternehmen *

Mehrfachauswahl möglich

- ☐ Einzelfertigung
- ☐ kleine und mittlere Serien
- ☐ große Serien
- ☐ Massenproduktion / kontinuierliche Produktion
- ☐ Dienstleistungen
- ☐ sonstige

p2_q5_Welche_Materialen_werden_von_Ihrem_Einkauf_abgedeckt

Welche Materialen werden von Ihrem Einkauf abgedeckt? *

Mehrfachauswahl möglich

- ☐ indirektes Material
- ☐ direktes Material
- ☐ Investitionsgüter
- ☐ Dienstleistungen
- ☐ sonstige

p2_q6_Beurteilen_Sie_folgende_Aussagen_zu_Ihrem_Unternehmen

Beurteilen Sie folgende Aussagen zu Ihrem Unternehmen *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
Lieferanteninnovation ist wichtig.	○	○	○	○	○
Lieferanten Know-how ist von hoher Bedeutung.	○	○	○	○	○

p2_q7_Welche_Bedeutung_haben_folgende_Beschaffungsmrkte_fr_Ihr_Unternehmen

Welche Bedeutung haben folgende Beschaffungsmärkte für Ihr Unternehmen? *

	sehr gering	gering	mittel	hoch	sehr hoch
Österreich	○	○	○	○	○
sonstige Industrieländer	○	○	○	○	○
Schwellenländer	○	○	○	○	○
Entwicklungsländer	○	○	○	○	○

Figure B.2: Survey questionnaire, page two

p3_q1_Bedeutung_folgender_Aufgaben_im_Einkauf_Ihres_Unternehmens

Bedeutung folgender Aufgaben im Einkauf Ihres Unternehmens *

	sehr gering	gering	mittel	hoch	sehr hoch
Ausschreibungen	○	○	○	○	○
Bestellabwicklung	○	○	○	○	○
Qualitätsmanagement	○	○	○	○	○
Lieferantensuche	○	○	○	○	○
Lieferantenbewertung	○	○	○	○	○
Lieferantenentwicklung	○	○	○	○	○
Logistik und Transport	○	○	○	○	○
Marktanalyse und -beobachtung	○	○	○	○	○
Stammdatenpflege	○	○	○	○	○
Risikomanagement (Lieferausfallszenarien etc.)	○	○	○	○	○
Mitwirken in Entwicklungsprozessen	○	○	○	○	○
Strategieentwicklung (Make-or-buy, Standardisierung etc.)	○	○	○	○	○
Vertragsmanagement	○	○	○	○	○
Ausgleichen Fremdwährungseinnahmen und -ausgaben	○	○	○	○	○
	○	○	○	○	○

Sonstige

p3_q2_Vernderung_der_Bedeutung_in_den_nchsten_10_Jahren

Veränderung der Bedeutung in den nächsten 10 Jahren *

	sinkt stark	sinkt	bleibt gleich	steigt	steigt stark
Ausschreibungen	○	○	○	○	○
Bestellabwicklung	○	○	○	○	○
Qualitätsmanagement	○	○	○	○	○
Lieferantensuche	○	○	○	○	○
Lieferantenbewertung	○	○	○	○	○
Lieferantenentwicklung	○	○	○	○	○
Logistik und Transport	○	○	○	○	○
Marktanalyse und -beobachtung	○	○	○	○	○
Stammdatenpflege	○	○	○	○	○
Risikomanagement (Lieferausfallszenarien etc.)	○	○	○	○	○
Mitwirken in Entwicklungsprozessen	○	○	○	○	○
Strategieentwicklung (Make-or-buy, Standardisierung etc.)	○	○	○	○	○
Vertragsmanagement	○	○	○	○	○
Ausgleichen Fremdwährungseinnahmen und -ausgaben	○	○	○	○	○
	○	○	○	○	○

Sonstige

Figure B.3: Survey questionnaire, page three

p4_q1_Bedeutung_der_Zusammenarbeit_mit_folgenden_Abteilungen

Bedeutung der Zusammenarbeit mit folgenden Abteilungen *

	sehr gering	gering	mittel	hoch	sehr hoch
Produktion	○	○	○	○	○
Finanzen und Controlling	○	○	○	○	○
Marketing und Vertrieb	○	○	○	○	○
Entwicklung	○	○	○	○	○
Qualitätssicherung	○	○	○	○	○
Rechtsabteilung	○	○	○	○	○

sonstige

p4_q2_Vernderung_der_Bedeutung_der_Zusammenarbeit_in_den_nchsten_10_Jahren

Veränderung der Bedeutung der Zusammenarbeit in den nächsten 10 Jahren *

	sinkt stark	sinkt	bleibt gleich	steigt	steigt stark
Produktion	○	○	○	○	○
Finanzen und Controlling	○	○	○	○	○
Marketing und Vertrieb	○	○	○	○	○
Entwicklung	○	○	○	○	○
Qualitätssicherung	○	○	○	○	○
Rechtsabteilung	○	○	○	○	○

sonstige

p4_q3_In_welche_Produktentwicklungsphasen_ist_der_Einkauf_in_Ihrem_Unternehmen_eingebunden

In welche Produktentwicklungsphasen ist der Einkauf in Ihrem Unternehmen eingebunden? *

Mehrfachauswahl möglich

- ☐ Angebotserstellung (bei make-to-order)
- ☐ Anforderungsanalyse
- ☐ Konzepterstellung
- ☐ Prototypenentwicklung
- ☐ Serienüberleitung
- ☐ Sonstige
- ☐ keine Einbindung

p4_q4_In_welche_Phasen_sollte_der_Einkauf_in_10_Jahren_eingebunden_sein

In welche Phasen sollte der Einkauf in 10 Jahren eingebunden sein? *

Mehrfachauswahl möglich

- ☐ Angebotserstellung (bei make-to-order)
- ☐ Anforderungsanalyse
- ☐ Konzepterstellung
- ☐ Prototypenentwicklung
- ☐ Serienüberleitung
- ☐ Sonstige
- ☐ keine Einbindung

p4_q5_Wie_funktioniert_die_Einbindung_des_Einkaufs_in_Entwicklungsprozesse

Wie funktioniert die Einbindung des Einkaufs in Entwicklungsprozesse? *

Mehrfachauswahl möglich

- ☐ Teilaufgabe von Einkaufsmitarbeitern
- ☐ eingene Stelle für Projekteinkäufer
- ☐ Liason-Stelle (zwischen Einkauf und Entwicklung)
- ☐ anders
- ☐ keine Angabe

p4_q6_Aufgaben_des_Einkaufs_im_Produktentwicklungsprozess_Ihres_Unternehmens

Aufgaben des Einkaufs im Produktentwicklungsprozess Ihres Unternehmens *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
einbringen von Marktwissen	○	○	○	○	○
Kostenbewusstsein schaffen	○	○	○	○	○
Verfügbarkeit von Ersatzteilen sicherstellen	○	○	○	○	○
Vermittlungsfunktion	○	○	○	○	○

Figure B.4: Survey questionnaire, page four

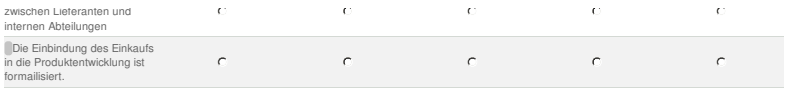

Figure B.5: Survey questionnaire, page five

p5_q1_Position_des_Einkaufsleiters_im_Organigramm

Position des Einkaufsleiters im Organigramm *

- ○ in der Geschäftsführung
- ○ 1. Ebene unter Geschäftsführung
- ○ mehr als 1 Ebene unter Geschäftsführung

p5_q2_Position_des_Einkaufsleiters_im_Organigramm_in_10_Jahren

Position des Einkaufsleiters im Organigramm in 10 Jahren *

- ○ in der Geschäftsführung
- ○ 1. Ebene unter Geschäftsführung
- ○ mehr als 1 Ebene unter Geschäftsführung

p5_q3_Welche_Aussagen_treffen_auf_den_Einkaufsleiter_Ihres_Unternehmens_zu

Welche Aussagen treffen auf den Einkaufsleiter Ihres Unternehmens zu? *

Mehrfachauswahl möglich

- ☐ verantwortet auch andere Bereiche (Supply Chain Management, Logistik, Lager, etc.)
- ☐ Einkaufsleiter ist einem anderen Funktionsbereich unterstellt

p5_q4_Organsation_des_Einkaufs_Ihres_Unternehmens

Organsation des Einkaufs Ihres Unternehmens *

- ○ nach Materialgruppen
- ○ nach Produktgruppen (Endprodukte)
- ○ matrixartig (sowohl nach Material- als auch Produktgruppen)
- ○ andere Organisation

p5_q5_Beurteilen_Sie_folgende_Aussage_zu_Ihrem_Unternehmen

Beurteilen Sie folgende Aussage zu Ihrem Unternehmen *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
Das Lead-Buyer Konzept wird umgesetzt.	○	○	○	○	○
Der Einkauf ist zentral organisiert.	○	○	○	○	○
Der operative und strategische Einkauf sind getrennt.	○	○	○	○	○
Das Lead-Buyer Konzept wird in 10 Jahren stärker umgesetzt.	○	○	○	○	○
Der Einkauf ist in 10 Jahren stärker zentralisiert.	○	○	○	○	○
Der Einkauf ist in 10 Jahren stärker dezentralisiert.	○	○	○	○	○
Der operative und strategische Einkauf sind in 10 Jahren stärker getrennt.	○	○	○	○	○

p5_q6_Beurteilen_Sie_folgende_Aussagen_zum_Stellenwert_des_Einkaufs_in_Ihrem_Unternehmen

Beurteilen Sie folgende Aussagen zum Stellenwert des Einkaufs in Ihrem Unternehmen *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
Der Einkauf ist weniger wichtig als andere Funktionsbereiche.	○	○	○	○	○
Der Einkauf ist wichtiger als andere Funktionensbereiche.	○	○	○	○	○
Der Stellenwert des Einkaufs steigt.	○	○	○	○	○
Der Einkaufserfolg wird monetär gemessen.	○	○	○	○	○
Der Einkaufserfolg wird nicht-monetär gemessen.	○	○	○	○	○
Der Einkaufserfolg wird in 10 Jahren stärker monetär gemessen.	○	○	○	○	○
Der Einkaufserfolg wird in 10 Jahren stärker nicht-monetär gemessen.	○	○	○	○	○

Figure B.6: Survey questionnaire, page six

p6_q1_Welche_Ausbildung_haben_die_Mitarbeiter_im_operativen_Einkauf_Ihres_Unternehmens

Welche Ausbildung haben die Mitarbeiter im operativen Einkauf Ihres Unternehmens? *

Mehrfachauswahl möglich

- ☐ kaufmännische Lehre
- ☐ technische Lehre
- ☐ AHS
- ☐ HAK
- ☐ HTL
- ☐ Fachhochschule
- ☐ wirtschaftliches Universitätsstudium
- ☐ technisches Universitätsstudium
- ☐ anderes Universitätsstudium
- ☐ MBA
- ☐ andere

p6_q2_Welche_Ausbildung_haben_die_Mitarbeiter_im_strategischen_Einkauf_Ihres_Unternehmens

Welche Ausbildung haben die Mitarbeiter im strategischen Einkauf Ihres Unternehmens? *

Mehrfachauswahl möglich

- ☐ kaufmännische Lehre
- ☐ technische Lehre
- ☐ AHS
- ☐ HAK
- ☐ HTL
- ☐ Fachhochschule
- ☐ wirtschaftliches Universitätsstudium
- ☐ technisches Universitätsstudium
- ☐ anderes Universitätsstudium
- ☐ MBA
- ☐ andere

p6_q3_Welche_Mindestausbildung_fordert_Ihr_Unternehmen_von_Berufseinsteigern_im_operativen_Einkauf

Welche Mindestausbildung fordert Ihr Unternehmen von Berufseinsteigern im operativen Einkauf? *

Mehrfachauswahl möglich

- ☐ kaufmännische Lehre
- ☐ technische Lehre
- ☐ AHS
- ☐ HAK
- ☐ HTL
- ☐ Fachhochschule
- ☐ wirtschaftliches Universitätsstudium
- ☐ technisches Universitätsstudium
- ☐ anderes Universitätsstudium
- ☐ MBA
- ☐ andere

p6_q4_Welche_Mindestausbildung_fordert_Ihr_Unternehmen_von_Berufseinsteigern_im_strategischen_Einkauf

Welche Mindestausbildung fordert Ihr Unternehmen von Berufseinsteigern im strategischen Einkauf? *

- ☐ kaufmännische Lehre
- ☐ technische Lehre
- ☐ AHS
- ☐ HAK
- ☐ HTL
- ☐ Fachhochschule
- ☐ wirtschaftliches Universitätsstudium
- ☐ technisches Universitätsstudium
- ☐ anderes Universitätsstudium
- ☐ MBA
- ☐ andere

p6_q5_Beurteilen_Sie_folgende_Aussage_zu_Ihrem_Unternehmen

Beurteilen Sie folgende Aussage zu Ihrem Unternehmen *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
Es ist schwierig geeignete Mitarbeiter für den Einkauf zu finden.	○	○	○	○	○
In 10 Jahren ist es schwieriger geeignete	○	○	○	○	○

Figure B.7: Survey questionnaire, page seven

Mitarbeiter zu finden.

Neue Mitarbeiter im Einkauf haben einen hohen Einschulungsbedarf.	○	○	○	○	○
Sie sind mit universitären Angebot an Einkaufsausbildungen zufrieden.	○	○	○	○	○
Die Karrierechancen von Mitarbeitern im Einkauf sind schlechter als in anderen Abteilungen.	○	○	○	○	○
Die Karrierechancen von Mitarbeitern im Einkauf sind besser als in anderen Abteilungen.	○	○	○	○	○

Figure B.8: Survey questionnaire, page eight

p7_q1_Bedeutung_folgender_Fhigkeiten_fr_Mitarbeiter_im_Einkauf_Ihres_Unternehmens

Bedeutung folgender Fähigkeiten für Mitarbeiter im Einkauf Ihres Unternehmens *

	sehr gering	gering	mittel	hoch	sehr hoch
Technologieverständnis	○	○	○	○	○
Produktionsverständnis	○	○	○	○	○
IT-Anwenderkenntnisse	○	○	○	○	○
Einkaufsgrundwissen	○	○	○	○	○
rechtliches Grundwissen	○	○	○	○	○
Projektmanagement	○	○	○	○	○
Verhandlungstechnik	○	○	○	○	○
Präsentationstechnik	○	○	○	○	○
Konfliktmanagement	○	○	○	○	○
Kommunikationsfähigkeiten	○	○	○	○	○
Englisch	○	○	○	○	○
weitere Fremdsprachen	○	○	○	○	○
Teamfähigkeit	○	○	○	○	○
selbständige Arbeitsweise	○	○	○	○	○
Belastbarkeit	○	○	○	○	○

sonstige

p7_q2_Wie_verndert_sich_die_Bedeutung

Wie verändert sich die Bedeutung? *

	sinkt stark	sinkt	bleibt gleich	steigt	steigt stark
Technologieverständnis	○	○	○	○	○
Produktionsverständnis	○	○	○	○	○
IT-Anwenderkenntnisse	○	○	○	○	○
Einkaufsgrundwissen	○	○	○	○	○
rechtliches Grundwissen	○	○	○	○	○
Projektmanagement	○	○	○	○	○
Verhandlungstechnik	○	○	○	○	○
Präsentationstechnik	○	○	○	○	○
Konfliktmanagement	○	○	○	○	○
Kommunikationsfähigkeiten	○	○	○	○	○
Englisch	○	○	○	○	○
weitere Fremdsprachen	○	○	○	○	○
Teamfähigkeit	○	○	○	○	○
selbständige Arbeitsweise	○	○	○	○	○
Belastbarkeit	○	○	○	○	○

sonstige

Figure B.9: Survey questionnaire, page nine

p8_q1_Beurteilen_Sie_folgende_Trends_im_Einkauf_in_den_nchsten_10_Jahren

Beurteilen Sie folgende Trends im Einkauf in den nächsten 10 Jahren *

	trifft nicht zu	trifft wenig zu	trifft teilweise zu	trifft zu	trifft sehr zu
Outsourcing von Einkaufsleistungen nimmt zu.	○	○	○	○	○
Offshoring von Einkaufsleistungen nimmt zu.	○	○	○	○	○
Automatisierung von operativen Aufaben nimmt zu.	○	○	○	○	○
Die Bedeutung strategischer Aufgaben steigt.	○	○	○	○	○
Die Produktpalette pro Einkäufer wird größer.	○	○	○	○	○
Der Technologie-Fokus steigt.	○	○	○	○	○
Die rechtlichen Anforderungen steigen.	○	○	○	○	○
Personalressourcen werden von operativen zu strategischen Aufgaben verlagert.	○	○	○	○	○
Der Anteil an Standard- oder Normteilen steigt.	○	○	○	○	○
Die Integration von Schlüssellieferanten wird intensiver.	○	○	○	○	○
Big Data Analysen gewinnen für den Einkauf an Bedeutung.	○	○	○	○	○
Supply Chains werden globaler und dadurch komplexer.	○	○	○	○	○
Es gibt zunehmend weniger und dafür größere Lieferanten (Konsolidierung).	○	○	○	○	○
Ökologische und soziale Nachhaltigkeit gewinnt in der Beschaffung an Bedeutung.	○	○	○	○	○

p8_q2_Anzahl_der_Frauen_im_Einkauf_Ihres_Unternehmens

Anzahl der Frauen im Einkauf Ihres Unternehmens *

Bitte geben Sie eine Schätzung an, falls nicht genau bekannt

im gesamten Einkauf	
im operativen Einkauf	
im strategischen Einkauf	
in Führungspositionen im Einkauf	

p8_q3_Geschlecht_des_Einkaufsleiters

Geschlecht des Einkaufsleiters *

- ○ Männlich
- ○ Weiblich

Figure B.10: Survey questionnaire, page ten

APPENDIX C

Mean t-tests

Note, that some questions consisted of check boxes, therefore, some answers were never ticked and are thus marked as not available (NA) within the tables.

Table C.1: Tasks now and company size

Tasks	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Order processing	small 3.80 (1.11)	middle 4.05 (0.89)	-0.79 (36.30)	0.435
	small 3.80 (1.11)	large 3.85 (1.39)	-0.13 (36.19)	0.900
	middle 3.80 (1.11)	large 3.85 (1.39)	0.54 (32.32)	0.591
Contract management	small 3.70 (0.92)	middle 3.65 (0.88)	0.18 (37.89)	0.861
	small 3.70 (0.92)	large 4.20 (0.77)	-1.86 (36.78)	0.071
	middle 3.70 (0.92)	large 4.20 (0.77)	-2.11 (37.37)	0.041
Supplier search	small 3.90 (0.85)	middle 3.95 (0.76)	-0.20 (37.50)	0.846
	small 3.90 (0.85)	large 3.70 (0.66)	0.83 (35.69)	0.411
	middle 3.90 (0.85)	large 3.70 (0.66)	1.11 (37.23)	0.273

Supplier evaluation	small 3.95 (0.76)	middle 3.60 (0.75)	1.46 (38.00)	0.152
	small 3.95 (0.76)	large 3.75 (0.97)	0.73 (35.98)	0.471
	middle 3.95 (0.76)	large 3.75 (0.97)	-0.55 (35.87)	0.588
Market analysing and observation	small 3.75 (0.91)	middle 3.65 (0.93)	0.34 (37.98)	0.733
	small 3.75 (0.91)	large 3.80 (0.70)	-0.20 (35.55)	0.846
	middle 3.75 (0.91)	large 3.80 (0.70)	-0.58 (35.14)	0.568
Supplier development	small 4.10 (0.79)	middle 3.65 (0.93)	1.65 (36.96)	0.108
	small 4.10 (0.79)	large 3.45 (0.94)	2.36 (36.82)	0.024
	middle 4.10 (0.79)	large 3.45 (0.94)	0.67 (37.99)	0.505
Quality management	small 3.75 (1.12)	middle 3.85 (0.75)	-0.33 (33.10)	0.741
	small 3.75 (1.12)	large 3.45 (1.15)	0.84 (37.98)	0.407
	middle 3.75 (1.12)	large 3.45 (1.15)	1.31 (32.63)	0.200
Risk management	small 3.70 (0.98)	middle 3.45 (1.00)	0.80 (37.98)	0.429
	small 3.70 (0.98)	large 3.50 (1.00)	0.64 (37.98)	0.527
	middle 3.70 (0.98)	large 3.50 (1.00)	-0.16 (38.00)	0.875
Strategy development	small 3.45 (1.00)	middle 3.85 (0.99)	-1.27 (38.00)	0.211
	small 3.45 (1.00)	large 3.30 (1.13)	0.45 (37.45)	0.659
	middle 3.45 (1.00)	large 3.30 (1.13)	1.64 (37.35)	0.109
Logistics and transport	small 3.80 (1.01)	middle 3.35 (1.18)	1.30 (37.04)	0.203
	small 3.80 (1.01)	large 3.30 (1.03)	1.55 (37.98)	0.129
	middle 3.80 (1.01)	large 3.30 (1.03)	0.14 (37.31)	0.887

Participating in RFQ	small 3.15 (1.23)	middle 3.30 (1.42)	-0.36 (37.22)	0.722
	small 3.15 (1.23)	large 3.90 (1.21)	-1.95 (37.99)	0.059
	middle 3.15 (1.23)	large 3.90 (1.21)	-1.44 (37.08)	0.158
Data updating	small 3.35 (1.14)	middle 3.55 (1.00)	-0.59 (37.38)	0.558
	small 3.35 (1.14)	large 3.15 (0.93)	0.61 (36.61)	0.547
	middle 3.35 (1.14)	large 3.15 (0.93)	1.31 (37.83)	0.199
Participating in R/D processes	small 3.60 (0.68)	middle 3.45 (1.23)	0.48 (29.57)	0.638
	small 3.60 (0.68)	large 2.70 (1.26)	2.81 (29.21)	0.009
	middle 3.60 (0.68)	large 2.70 (1.26)	1.90 (37.98)	0.065
FOREX balancing	small 2.10 (0.97)	middle 2.00 (0.92)	0.34 (37.89)	0.739
	small 2.10 (0.97)	large 2.25 (1.12)	-0.45 (37.24)	0.653
	middle 2.10 (0.97)	large 2.25 (1.12)	-0.77 (36.61)	0.445

Table C.2: Tasks in 10 years and company size

Tasks	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Supplier development	small 3.95 (0.69)	middle 4.10 (0.64)	-0.71 (37.82)	0.479
	small 3.95 (0.69)	large 3.95 (0.69)	0.00 (38.00)	1.000
	middle 3.95 (0.69)	large 3.95 (0.69)	0.71 (37.82)	0.479
Risk management	small 3.80 (0.62)	middle 4.20 (0.77)	-1.82 (36.29)	0.077
	small 3.80 (0.62)	large 3.75 (0.72)	0.24 (37.16)	0.814
	middle 3.80 (0.62)	large 3.75 (0.72)	1.92 (37.82)	0.063

Market analysing and observation	small 3.75 (0.72)	middle 4.00 (0.79)	-1.04 (37.60)	0.303
	small 3.75 (0.72)	large 3.90 (0.64)	-0.70 (37.54)	0.489
	middle 3.75 (0.72)	large 3.90 (0.64)	0.44 (36.36)	0.664
Strategy development	small 3.80 (0.62)	middle 4.05 (0.76)	-1.14 (36.44)	0.260
	small 3.80 (0.62)	large 3.65 (0.88)	0.63 (34.11)	0.535
	middle 3.80 (0.62)	large 3.65 (0.88)	1.54 (37.26)	0.131
Participating in R/D processes	small 3.95 (0.69)	middle 3.90 (0.79)	0.21 (37.30)	0.832
	small 3.95 (0.69)	large 3.65 (0.59)	1.49 (37.11)	0.146
	middle 3.95 (0.69)	large 3.65 (0.59)	1.14 (35.12)	0.263
Quality management	small 3.80 (0.70)	middle 3.80 (0.62)	0.00 (37.44)	1.000
	small 3.80 (0.70)	large 3.60 (0.60)	0.97 (37.16)	0.336
	middle 3.80 (0.70)	large 3.60 (0.60)	1.04 (37.97)	0.304
Supplier evaluation	small 3.55 (0.51)	middle 3.90 (0.45)	-2.31 (37.35)	0.027
	small 3.55 (0.51)	large 3.65 (0.88)	-0.44 (30.59)	0.662
	middle 3.55 (0.51)	large 3.65 (0.88)	1.14 (28.29)	0.265
Supplier search	small 3.65 (0.67)	middle 3.70 (0.57)	-0.25 (37.06)	0.801
	small 3.65 (0.67)	large 3.60 (0.75)	0.22 (37.49)	0.826
	middle 3.65 (0.67)	large 3.60 (0.75)	0.47 (35.41)	0.639
Participating in RFQ	small 3.50 (0.51)	middle 3.80 (0.70)	-1.55 (34.94)	0.130
	small 3.50 (0.51)	large 3.45 (0.69)	0.26 (35.18)	0.796
	middle 3.50 (0.51)	large 3.45 (0.69)	1.60 (37.99)	0.118

Contract management	small 3.60 (0.60)	middle 3.75 (0.64)	-0.77 (37.84)	0.448
	small 3.60 (0.60)	large 3.35 (0.59)	1.33 (37.99)	0.190
	middle 3.60 (0.60)	large 3.35 (0.59)	2.06 (37.73)	0.046
Logistics and transport	small 3.45 (0.69)	middle 3.80 (0.83)	-1.45 (36.65)	0.156
	small 3.45 (0.69)	large 3.45 (0.60)	0.00 (37.41)	1.000
	middle 3.45 (0.69)	large 3.45 (0.60)	1.52 (34.66)	0.138
FOREX balancing	small 3.10 (0.64)	middle 3.10 (0.64)	0.00 (38.00)	1.000
	small 3.10 (0.64)	large 3.20 (0.70)	-0.47 (37.74)	0.639
	middle 3.10 (0.64)	large 3.20 (0.70)	-0.47 (37.74)	0.639
Data updating	small 3.05 (0.69)	middle 3.45 (0.83)	-1.67 (36.77)	0.104
	small 3.05 (0.69)	large 2.85 (0.81)	0.84 (36.96)	0.406
	middle 3.05 (0.69)	large 2.85 (0.81)	2.32 (37.99)	0.026
Order processing	small 3.00 (0.73)	middle 2.90 (0.79)	0.42 (37.74)	0.679
	small 3.00 (0.73)	large 2.85 (0.88)	0.59 (36.74)	0.559
	middle 3.00 (0.73)	large 2.85 (0.88)	0.19 (37.59)	0.850

Table C.3: Tasks now and supplier dependency

Tasks	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Order processing	weaker 3.64 (1.21)	stronger 3.96 (1.12)	-0.81 (14.12)	0.430
Contract management	weaker 3.73 (0.90)	stronger 3.88 (0.88)	-0.50 (14.58)	0.624

Supplier search	weaker 3.91 (0.83)	stronger 3.84 (0.75)	0.27 (13.85)	0.794
Supplier evaluation	weaker 3.09 (0.83)	stronger 3.92 (0.76)	-3.03 (14.00)	0.009
Market analysing and observation	weaker 4.00 (0.89)	stronger 3.67 (0.83)	1.11 (14.09)	0.286
Supplier development	weaker 2.82 (0.87)	stronger 3.94 (0.80)	-3.90 (14.03)	0.002
Quality management	weaker 3.64 (1.03)	stronger 3.69 (1.02)	-0.17 (14.82)	0.869
Risk management	weaker 3.45 (1.04)	stronger 3.57 (0.98)	-0.34 (14.29)	0.738
Strategy development	weaker 2.82 (0.75)	stronger 3.69 (1.04)	-3.23 (19.81)	0.004
Logistics and transport	weaker 3.55 (1.21)	stronger 3.47 (1.06)	0.19 (13.65)	0.851
Participating in RFQ	weaker 3.27 (1.62)	stronger 3.49 (1.24)	-0.42 (12.78)	0.683
Data updating	weaker 3.27 (1.10)	stronger 3.37 (1.01)	-0.26 (14.05)	0.798
Participating in R/D processes	weaker 2.00 (1.10)	stronger 3.53 (0.96)	-4.28 (13.66)	<0.001
FOREX balancing	weaker 2.00 (1.00)	stronger 2.14 (1.00)	-0.43 (14.84)	0.675

Table C.4: Tasks in 10 years and supplier dependency

Tasks	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Supplier development	weaker 4.00 (0.63)	stronger 4.00 (0.68)	0.00 (15.59)	1.000
Risk management	weaker 4.00 (0.45)	stronger 3.90 (0.77)	0.59 (25.41)	0.563
Market analysing and observation	weaker 4.18 (0.60)	stronger 3.82 (0.73)	1.75 (17.20)	0.099
Strategy development	weaker 3.55 (0.82)	stronger 3.90 (0.74)	-1.31 (13.92)	0.211
Participating in R/D processes	weaker 3.36 (0.67)	stronger 3.94 (0.66)	-2.57 (14.60)	0.022

Quality management	weaker 3.73 (0.79)	stronger 3.73 (0.60)	-0.03 (12.79)	0.977
Supplier evaluation	weaker 3.64 (0.67)	stronger 3.71 (0.65)	-0.35 (14.41)	0.732
Supplier search	weaker 3.73 (0.90)	stronger 3.63 (0.60)	0.33 (12.06)	0.746
Participating in RFQ	weaker 4.00 (0.77)	stronger 3.49 (0.58)	2.06 (12.65)	0.061
Contract management	weaker 3.82 (0.60)	stronger 3.51 (0.62)	1.52 (15.07)	0.148
Logistics and transport	weaker 4.09 (0.70)	stronger 3.45 (0.68)	2.76 (14.52)	0.015
FOREX balancing	weaker 3.18 (0.60)	stronger 3.12 (0.67)	0.29 (15.97)	0.776
Data updating	weaker 3.00 (0.89)	stronger 3.14 (0.79)	-0.49 (13.73)	0.633
Order processing	weaker 3.18 (0.87)	stronger 2.86 (0.76)	1.14 (13.64)	0.275

Table C.5: Other departments now and company size

Departments	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Manufacturing / Production	small 4.25 (0.72)	middle 3.95 (1.10)	1.02 (32.68)	0.314
	small 4.25 (0.72)	large 3.90 (0.91)	1.35 (35.98)	0.186
	middle 4.25 (0.72)	large 3.90 (0.91)	0.16 (36.75)	0.876
Finance and Controlling	small 3.55 (0.76)	middle 3.90 (0.79)	-1.43 (37.95)	0.161
	small 3.55 (0.76)	large 3.55 (1.15)	0.00 (32.98)	1.000
	middle 3.55 (0.76)	large 3.55 (1.15)	1.13 (33.69)	0.268

Quality management	small 3.85 (0.81)	middle 3.65 (0.99)	0.70 (36.64)	0.489
	small 3.85 (0.81)	large 3.20 (1.01)	2.25 (36.40)	0.031
	middle 3.85 (0.81)	large 3.20 (1.01)	1.43 (37.99)	0.162
R/D	small 3.95 (0.69)	middle 3.50 (1.36)	1.32 (28.12)	0.196
	small 3.95 (0.69)	large 2.90 (1.29)	3.21 (28.91)	0.003
	middle 3.95 (0.69)	large 2.90 (1.29)	1.43 (37.91)	0.161
Legal department	small 2.90 (0.91)	middle 2.95 (1.19)	-0.15 (35.58)	0.882
	small 2.90 (0.91)	large 3.75 (0.97)	-2.86 (37.87)	0.007
	middle 2.90 (0.91)	large 3.75 (0.97)	-2.33 (36.46)	0.025
Marketing and Sales	small 3.30 (0.86)	middle 3.00 (1.30)	0.86 (33.09)	0.396
	small 3.30 (0.86)	large 3.10 (1.33)	0.56 (32.57)	0.577
	middle 3.30 (0.86)	large 3.10 (1.33)	-0.24 (37.97)	0.811

Table C.6: Other departments in 10 years and company size

Departments	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
R/D	small 3.75 (0.44)	middle 3.65 (0.75)	0.52 (30.99)	0.610
	small 3.75 (0.44)	large 3.50 (0.51)	1.65 (37.24)	0.108
	middle 3.75 (0.44)	large 3.50 (0.51)	0.74 (33.71)	0.464
Quality management	small 3.70 (0.57)	middle 3.65 (0.59)	0.27 (37.97)	0.786
	small 3.70 (0.57)	large 3.50 (0.51)	1.16 (37.57)	0.251
	middle 3.70 (0.57)	large 3.50 (0.51)	0.86 (37.33)	0.395

Marketing and Sales	small 3.45 (0.51)	middle 3.50 (0.69)	-0.26 (35.05)	0.796
	small 3.45 (0.51)	large 3.40 (0.50)	0.31 (37.99)	0.757
	middle 3.45 (0.51)	large 3.40 (0.50)	0.52 (34.78)	0.603
Finance and Controlling	small 3.35 (0.49)	middle 3.35 (0.59)	0.00 (36.81)	1.000
	small 3.35 (0.49)	large 3.35 (0.49)	0.00 (38.00)	1.000
	middle 3.35 (0.49)	large 3.35 (0.49)	0.00 (36.81)	1.000
Manufacturing / Production	small 3.25 (0.64)	middle 3.20 (0.41)	0.29 (32.40)	0.770
	small 3.25 (0.64)	large 3.30 (0.47)	-0.28 (34.92)	0.780
	middle 3.25 (0.64)	large 3.30 (0.47)	-0.72 (37.32)	0.478
Legal department	small 3.15 (0.49)	middle 3.25 (0.55)	-0.61 (37.49)	0.547
	small 3.15 (0.49)	large 3.30 (0.47)	-0.99 (37.94)	0.329
	middle 3.15 (0.49)	large 3.30 (0.47)	-0.31 (37.10)	0.759

Table C.7: Other departments now and supplier dependency

Departments	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Manufacturing / Production	weaker 4.18 (0.75)	stronger 4.00 (0.96)	0.69 (18.13)	0.500
Finance and Controlling	weaker 3.45 (0.93)	stronger 3.71 (0.91)	-0.84 (14.61)	0.416
Quality management	weaker 2.91 (1.04)	stronger 3.71 (0.89)	-2.37 (13.45)	0.033
R/D	weaker 2.82 (1.33)	stronger 3.59 (1.15)	-1.79 (13.59)	0.096
Legal department	weaker 3.09 (1.14)	stronger 3.22 (1.09)	-0.36 (14.39)	0.728

Marketing and Sales	weaker 2.64 (1.21)	stronger 3.24 (1.15)	-1.53 (14.34)	0.149

Table C.8: Other departments in 10 years and supplier dependency

Departments	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
R/D	weaker 3.64 (0.50)	stronger 3.63 (0.60)	0.02 (17.05)	0.983
Quality management	weaker 3.82 (0.40)	stronger 3.57 (0.58)	1.68 (20.35)	0.109
Marketing and Sales	weaker 3.55 (0.52)	stronger 3.43 (0.58)	0.66 (15.99)	0.520
Finance and Controlling	weaker 3.55 (0.52)	stronger 3.31 (0.51)	1.38 (14.57)	0.188
Manufacturing / Production	weaker 3.36 (0.50)	stronger 3.22 (0.51)	0.82 (14.97)	0.422
Legal department	weaker 3.09 (0.54)	stronger 3.27 (0.49)	-0.98 (13.96)	0.341

Table C.9: Development stages now and company size

Development Stages	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Participating in RFQ	small 0.01 (0.00)	middle 0.01 (0.01)	0.29 (31.22)	0.772
	small 0.01 (0.00)	large 0.02 (0.01)	-0.94 (37.61)	0.354
	middle 0.01 (0.00)	large 0.02 (0.01)	-0.99 (33.14)	0.331
SpecificationAnalysis	small 0.01 (0.01)	middle 0.01 (0.01)	-0.18 (37.14)	0.856
	small 0.01 (0.01)	large 0.01 (0.01)	-0.72 (37.79)	0.474
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.49 (37.77)	0.624

Concept Development	small 0.01 (0.01)	middle 0.01 (0.01)	0.53 (37.44)	0.601
	small 0.01 (0.01)	large 0.01 (0.01)	-0.02 (37.57)	0.983
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.52 (37.99)	0.605
Prototype Development	small 0.01 (0.01)	middle 0.01 (0.01)	-0.71 (37.25)	0.481
	small 0.01 (0.01)	large 0.01 (0.01)	0.38 (37.87)	0.709
	middle 0.01 (0.01)	large 0.01 (0.01)	1.04 (37.74)	0.304
Transition to Series Production	small 0.01 (0.01)	middle 0.01 (0.01)	0.48 (37.14)	0.632
	small 0.01 (0.01)	large 0.01 (0.01)	1.29 (37.79)	0.206
	middle 0.01 (0.01)	large 0.01 (0.01)	0.72 (37.77)	0.474
No Involvement	small 0.00 (0.00)	middle 0.00 (0.00)	-1.00 (19.00)	0.330
	small 0.00 (0.00)	large 0.00 (0.00)	-1.00 (19.00)	0.330
	middle 0.00 (0.00)	large 0.00 (0.00)	0.03 (37.95)	0.980

Table C.10: Development stages in 10 years and company size

Development Stages	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Participating in RFQ	small 0.01 (0.00)	middle 0.01 (0.00)	-0.04 (36.21)	0.967
	small 0.01 (0.00)	large 0.01 (0.01)	-0.83 (37.53)	0.414
	middle 0.01 (0.00)	large 0.01 (0.01)	-0.86 (34.34)	0.395
SpecificationAnalysis	small 0.01 (0.00)	middle 0.01 (0.00)	-0.04 (36.21)	0.967
	small 0.01 (0.00)	large 0.01 (0.01)	-0.35 (36.21)	0.731
	middle 0.01 (0.00)	large 0.01 (0.01)	-0.34 (32.21)	0.738

Concept Development	small 0.01 (0.01)	middle 0.01 (0.01)	0.67 (37.97)	0.508
	small 0.01 (0.01)	large 0.01 (0.00)	-1.73 (36.89)	0.092
	middle 0.01 (0.01)	large 0.01 (0.00)	-2.43 (36.55)	0.020
Prototye Development	small 0.01 (0.01)	middle 0.01 (0.01)	-1.09 (36.70)	0.281
	small 0.01 (0.01)	large 0.01 (0.01)	-0.06 (37.48)	0.955
	middle 0.01 (0.01)	large 0.01 (0.01)	0.96 (34.88)	0.346
Transition to Series Production	small 0.01 (0.01)	middle 0.01 (0.01)	0.22 (37.90)	0.829
	small 0.01 (0.01)	large 0.00 (0.01)	1.96 (37.80)	0.058
	middle 0.01 (0.01)	large 0.00 (0.01)	1.79 (37.42)	0.081
No Involvement	small 0.00 (0.00)	middle 0.00 (0.00)	1.00 (19.00)	0.330
	small 0.00 (0.00)	large 0.00 (0.00)	1.00 (19.00)	0.330
	middle NA (NA)	large NA (NA)	NA (NA)	NA

Table C.11: Development stages now and supplier dependency

Development Stages	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Participating in RFQ	weaker 0.03 (0.02)	stronger 0.01 (0.00)	3.36 (10.03)	0.007
SpecificationAnalysis	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.32 (10.08)	0.042
Concept Development	weaker 0.02 (0.02)	stronger 0.00 (0.00)	1.92 (10.09)	0.084
Prototype Development	weaker 0.01 (0.02)	stronger 0.00 (0.00)	0.93 (10.14)	0.374
Transition to Series Production	weaker 0.01 (0.02)	stronger 0.00 (0.00)	0.88 (10.14)	0.398
No Involvement	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.97 (10.02)	0.356

Table C.12: Development stages in 10 years and supplier dependency

Development Stages	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Participating in RFQ	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.56 (10.02)	0.028
SpecificationAnalysis	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.58 (10.03)	0.027
Concept Development	weaker 0.03 (0.02)	stronger 0.00 (0.00)	4.26 (10.07)	0.002
Prototye Development	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.27 (10.09)	0.046
Transition to Series Production	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.30 (10.12)	0.223
No Involvement	weaker 0.00 (0.01)	stronger 0.00 (0.00)	1.00 (10.00)	0.341

Table C.13: Type of integration and company size

Type of Integration	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Subtask of Purchasing Employee	small 0.03 (0.02)	middle 0.03 (0.03)	0.69 (34.27)	0.492
	small 0.03 (0.02)	large 0.03 (0.02)	0.61 (37.95)	0.543
	middle 0.03 (0.02)	large 0.03 (0.02)	-0.18 (34.93)	0.859
separate Project Purchaser	small 0.01 (0.02)	middle 0.01 (0.02)	-0.98 (34.45)	0.335
	small 0.01 (0.02)	large 0.01 (0.02)	-0.71 (37.17)	0.480
	middle 0.01 (0.02)	large 0.01 (0.02)	0.32 (36.80)	0.749
Liason-Position btw. Dev/Purchasing	small 0.01 (0.02)	middle 0.01 (0.02)	0.21 (37.97)	0.835
	small 0.01 (0.02)	large 0.01 (0.02)	0.07 (37.93)	0.948
	middle 0.01 (0.02)	large 0.01 (0.02)	-0.15 (37.82)	0.883

Table C.14: Type of integration and supplier dependency

Type of Integration	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Subtask of Purchasing Employee	weaker 0.05 (0.05)	stronger 0.01 (0.01)	2.51 (10.12)	0.030
separate Project Purchaser	weaker 0.02 (0.04)	stronger 0.00 (0.01)	1.12 (10.19)	0.287
Liason-Position btw. Dev/Purchasing	weaker 0.02 (0.04)	stronger 0.00 (0.01)	1.70 (10.11)	0.119

Table C.15: CPO position now and company size

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Board	small 0.00 (0.02)	middle 0.00 (0.01)	0.59 (34.69)	0.561
	small 0.00 (0.02)	large 0.00 (0.00)	1.45 (19.00)	0.163
	middle 0.00 (0.02)	large 0.00 (0.00)	1.00 (19.00)	0.330
Board -1	small 0.04 (0.02)	middle 0.04 (0.02)	0.78 (36.67)	0.442
	small 0.04 (0.02)	large 0.04 (0.02)	0.78 (36.67)	0.442
	middle 0.04 (0.02)	large 0.04 (0.02)	0.00 (38.00)	1.000
below Board -1	small 0.00 (0.01)	middle 0.01 (0.02)	-1.44 (29.37)	0.162
	small 0.00 (0.01)	large 0.01 (0.02)	-1.80 (28.05)	0.083
	middle 0.00 (0.01)	large 0.01 (0.02)	-0.37 (37.76)	0.714

Table C.16: CPO position in 10 years and company size

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Board	small 0.01 (0.02)	middle 0.01 (0.02)	-0.41 (37.52)	0.687
	small 0.01 (0.02)	large 0.01 (0.02)	0.00 (38.00)	1.000
	middle 0.01 (0.02)	large 0.01 (0.02)	0.41 (37.52)	0.687
Board -1	small 0.04 (0.02)	middle 0.04 (0.02)	0.37 (37.76)	0.714
	small 0.04 (0.02)	large 0.04 (0.02)	0.72 (37.32)	0.478
	middle 0.04 (0.02)	large 0.04 (0.02)	0.35 (37.88)	0.731
below Board -1	small 0.00 (0.01)	middle 0.00 (0.01)	0.00 (38.00)	1.000
	small 0.00 (0.01)	large 0.01 (0.02)	-1.04 (31.43)	0.305
	middle 0.00 (0.01)	large 0.01 (0.02)	-1.04 (31.43)	0.305

Table C.17: CPO position now and supplier dependency

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Board	weaker 0.01 (0.03)	stronger 0.00 (0.00)	0.90 (10.10)	0.391
Board -1	weaker 0.07 (0.04)	stronger 0.02 (0.01)	5.25 (10.25)	<0.001
below Board -1	weaker 0.01 (0.03)	stronger 0.00 (0.01)	0.54 (10.38)	0.600

Table C.18: CPO position in 10 years and supplier dependency

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Board	weaker 0.02 (0.04)	stronger 0.00 (0.01)	1.70 (10.13)	0.119
Board -1	weaker 0.07 (0.04)	stronger 0.02 (0.01)	3.94 (10.20)	0.003
below Board -1	weaker 0.00 (0.00)	stronger 0.00 (0.01)	-2.34 (48.00)	0.024

Table C.19: Organization and company size

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Material Groups	small 0.02 (0.03)	middle 0.02 (0.03)	0.00 (38.00)	1.000
	small 0.02 (0.03)	large 0.03 (0.03)	-0.62 (38.00)	0.539
	middle 0.02 (0.03)	large 0.03 (0.03)	-0.62 (38.00)	0.539
Product Groups	small 0.01 (0.02)	middle 0.00 (0.00)	1.83 (19.00)	0.083
	small 0.01 (0.02)	large 0.00 (0.02)	0.47 (36.90)	0.643
	middle 0.01 (0.02)	large 0.00 (0.02)	-1.45 (19.00)	0.163
Matrix	small 0.02 (0.02)	middle 0.02 (0.03)	-0.63 (37.93)	0.531
	small 0.02 (0.02)	large 0.01 (0.02)	0.68 (37.65)	0.503
	middle 0.02 (0.02)	large 0.01 (0.02)	1.32 (37.29)	0.194
Other	small 0.00 (0.01)	middle 0.00 (0.02)	-0.59 (34.69)	0.561
	small 0.00 (0.01)	large 0.00 (0.02)	-0.59 (34.69)	0.561
	middle 0.00 (0.01)	large 0.00 (0.02)	0.00 (38.00)	1.000

Table C.20: Organization and supplier dependency

CPO Position	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Material Groups	weaker 0.04 (0.05)	stronger 0.01 (0.01)	2.18 (10.21)	0.054
Product Groups	weaker 0.00 (0.00)	stronger 0.00 (0.01)	-2.34 (48.00)	0.024
Matrix	weaker 0.03 (0.05)	stronger 0.01 (0.01)	1.87 (10.21)	0.091
Other	weaker 0.02 (0.04)	stronger 0.00 (0.00)	1.38 (10.08)	0.199

Table C.21: Trends and company size

Statement	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
The Purchasing Function is organized central.	small 4.20 (0.70)	middle 3.75 (1.33)	1.34 (28.64)	0.191
	small 4.20 (0.70)	large 3.90 (0.85)	1.22 (36.54)	0.231
	middle 4.20 (0.70)	large 3.90 (0.85)	-0.42 (32.31)	0.674
The Lead-Buyer Concept will be broader applied in 10 years.	small 3.40 (0.99)	middle 3.50 (1.36)	-0.27 (34.84)	0.792
	small 3.40 (0.99)	large 3.40 (1.19)	0.00 (36.87)	1.000
	middle 3.40 (0.99)	large 3.40 (1.19)	0.25 (37.34)	0.806
The operative and strategic Purchasing are seperated.	small 3.05 (1.57)	middle 2.85 (1.60)	0.40 (37.99)	0.692
	small 3.05 (1.57)	large 3.70 (1.03)	-1.55 (32.80)	0.132
	middle 3.05 (1.57)	large 3.70 (1.03)	-2.00 (32.48)	0.054
The Purchasing Function will be organized more centrally in 10 years.	small 3.00 (1.30)	middle 3.10 (0.79)	-0.29 (31.34)	0.770
	small 3.00 (1.30)	large 3.30 (1.13)	-0.78 (37.28)	0.440
	middle 3.00 (1.30)	large 3.30 (1.13)	-0.65 (33.97)	0.520

The Lead-Buyer Concept is applied.	small 2.90 (1.29)	middle 2.85 (1.39)	0.12 (37.82)	0.907
	small 2.90 (1.29)	large 3.50 (1.28)	-1.48 (37.99)	0.148
	middle 2.90 (1.29)	large 3.50 (1.28)	-1.54 (37.75)	0.131
The operative and strategic Purchasing are seperated more strictly in 10 years.	small 2.50 (1.28)	middle 3.15 (0.99)	-1.80 (35.74)	0.080
	small 2.50 (1.28)	large 3.00 (1.21)	-1.27 (37.90)	0.212
	middle 2.50 (1.28)	large 3.00 (1.21)	0.43 (36.50)	0.671
The Purchasing Function will be organized more decentrally in 10 years.	small 1.75 (1.07)	middle 2.15 (1.09)	-1.17 (37.99)	0.249
	small 1.75 (1.07)	large 1.85 (0.99)	-0.31 (37.76)	0.760
	middle 1.75 (1.07)	large 1.85 (0.99)	0.91 (37.64)	0.367

Table C.22: Trends and supplier dependency

Statement	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
The Purchasing Function is organized central.	weaker 4.45 (0.69)	stronger 3.84 (1.03)	2.43 (21.42)	0.024
The Lead-Buyer Concept will be broader applied in 10 years.	weaker 3.64 (1.12)	stronger 3.39 (1.19)	0.66 (15.47)	0.520
The operative and strategic Purchasing are seperated.	weaker 3.18 (1.47)	stronger 3.20 (1.46)	-0.05 (14.74)	0.964
The Purchasing Function will be organized more centrally in 10 years.	weaker 3.55 (0.82)	stronger 3.04 (1.12)	1.71 (19.37)	0.102
The Lead-Buyer Concept is applied.	weaker 2.27 (1.27)	stronger 3.27 (1.29)	-2.33 (14.96)	0.034
The operative and strategic Purchasing are seperated more strictly in 10 years.	weaker 2.91 (1.04)	stronger 2.88 (1.22)	0.09 (16.72)	0.931
The Purchasing Function will be organized more decentrally in 10 years.	weaker 1.55 (0.82)	stronger 2.00 (1.08)	-1.56 (18.71)	0.136

Table C.23: Status and company size

Statement	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
The success in Purchasing is measured monetary.	small 3.20 (1.20)	middle 3.20 (1.28)	0.00 (37.82)	1.000
	small 3.20 (1.20)	large 3.75 (0.91)	-1.64 (35.48)	0.111
	middle 3.20 (1.20)	large 3.75 (0.91)	-1.56 (34.29)	0.127
The importance of the Purchasing Function increases.	small 3.40 (0.88)	middle 3.15 (1.23)	0.74 (34.53)	0.464
	small 3.40 (0.88)	large 3.60 (0.75)	-0.77 (37.09)	0.446
	middle 3.40 (0.88)	large 3.60 (0.75)	-1.40 (31.58)	0.172
The success in Purchasing will be measred stronger monetary in 10 years.	small 3.50 (1.15)	middle 2.85 (0.99)	1.92 (37.18)	0.063
	small 3.50 (1.15)	large 3.50 (1.00)	0.00 (37.31)	1.000
	middle 3.50 (1.15)	large 3.50 (1.00)	-2.07 (37.99)	0.046
The successs in Purchasing is measred non-monetary.	small 2.60 (1.31)	middle 2.70 (1.17)	-0.25 (37.53)	0.801
	small 2.60 (1.31)	large 2.40 (1.19)	0.51 (37.62)	0.616
	middle 2.60 (1.31)	large 2.40 (1.19)	0.80 (38.00)	0.427
The success in Purchasing will be measred stronger non-monetary in 10 years.	small 2.25 (1.41)	middle 2.75 (1.25)	-1.19 (37.47)	0.243
	small 2.25 (1.41)	large 2.50 (1.05)	-0.64 (35.14)	0.529
	middle 2.25 (1.41)	large 2.50 (1.05)	0.68 (36.90)	0.498
The Purchasing Function is more important than other Functions.	small 2.15 (0.99)	middle 2.35 (0.93)	-0.66 (37.88)	0.514
	small 2.15 (0.99)	large 2.35 (1.09)	-0.61 (37.64)	0.547
	middle 2.15 (0.99)	large 2.35 (1.09)	0.00 (37.13)	1.000

The Purchasing Function is less important than other Functions.	small 1.90 (1.02)	middle 2.35 (1.23)	-1.26 (36.79)	0.215
	small 1.90 (1.02)	large 2.05 (1.15)	-0.44 (37.50)	0.665
	middle 1.90 (1.02)	large 2.05 (1.15)	0.80 (37.83)	0.429

Table C.24: Status and supplier dependency

Statement	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
The success in Purchasing is measured monetary.	weaker 3.64 (1.03)	stronger 3.33 (1.18)	0.88 (16.50)	0.392
The importance of the Purchasing Function increases.	weaker 3.36 (1.21)	stronger 3.39 (0.93)	-0.06 (12.81)	0.951
The success in Purchasing will be measred stronger monetary in 10 years.	weaker 3.09 (0.94)	stronger 3.33 (1.11)	-0.72 (16.79)	0.479
The successs in Purchasing is measred non-monetary.	weaker 2.64 (1.21)	stronger 2.55 (1.23)	0.21 (15.01)	0.835
The success in Purchasing will be measred stronger non-monetary in 10 years.	weaker 3.18 (1.08)	stronger 2.35 (1.23)	2.26 (16.44)	0.038
The Purchasing Function is more important than other Functions.	weaker 2.36 (1.21)	stronger 2.27 (0.95)	0.25 (12.94)	0.804
The Purchasing Function is less important than other Functions.	weaker 1.91 (1.04)	stronger 2.14 (1.15)	-0.66 (15.99)	0.520

Table C.25: Current education operative purchasing personnal and company size

Education - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	small 0.02 (0.01)	middle 0.01 (0.01)	1.08 (29.22)	0.287
	small 0.02 (0.01)	large 0.01 (0.00)	2.79 (23.40)	0.010
	middle 0.02 (0.01)	large 0.01 (0.00)	2.69 (32.16)	0.011

technische Lehre	small 0.00 (0.01)	middle 0.01 (0.01)	-1.27 (37.56)	0.212
	small 0.00 (0.01)	large 0.00 (0.01)	-0.14 (29.87)	0.887
	middle 0.00 (0.01)	large 0.00 (0.01)	1.46 (31.87)	0.155
AHS	small 0.00 (0.01)	middle 0.00 (0.01)	-0.65 (37.80)	0.520
	small 0.00 (0.01)	large 0.00 (0.01)	-0.77 (33.12)	0.449
	middle 0.00 (0.01)	large 0.00 (0.01)	-0.03 (34.47)	0.976
HAK	small 0.01 (0.01)	middle 0.01 (0.01)	0.98 (31.65)	0.335
	small 0.01 (0.01)	large 0.01 (0.00)	1.70 (22.24)	0.102
	middle 0.01 (0.01)	large 0.01 (0.00)	0.91 (27.16)	0.369
HTL	small 0.00 (0.01)	middle 0.01 (0.01)	-2.70 (33.48)	0.011
	small 0.00 (0.01)	large 0.01 (0.01)	-3.21 (37.53)	0.003
	middle 0.00 (0.01)	large 0.01 (0.01)	0.28 (31.37)	0.780
Fachhochschule	small 0.00 (0.01)	middle 0.00 (0.01)	0.21 (34.56)	0.835
	small 0.00 (0.01)	large 0.00 (0.01)	-0.14 (29.87)	0.887
	middle 0.00 (0.01)	large 0.00 (0.01)	-0.46 (35.81)	0.646
wirtschaftliches Universitätsstudium	small 0.00 (0.01)	middle 0.00 (0.00)	1.34 (24.74)	0.193
	small 0.00 (0.01)	large 0.01 (0.01)	-0.58 (30.24)	0.569
	middle 0.00 (0.01)	large 0.01 (0.01)	-3.03 (33.67)	0.005
technisches Universitätsstudium	small 0.00 (0.01)	middle 0.00 (0.00)	0.30 (32.45)	0.767
	small 0.00 (0.01)	large 0.00 (0.00)	-0.81 (36.46)	0.423
	middle 0.00 (0.01)	large 0.00 (0.00)	-1.35 (36.13)	0.185

anderes Universitätsstudium	small 0.00 (0.00)	middle 0.00 (0.00)	-1.00 (19.00)	0.330
	small 0.00 (0.00)	large 0.00 (0.00)	-2.18 (19.00)	0.042
	middle 0.00 (0.00)	large 0.00 (0.00)	-1.00 (37.15)	0.323
MBA	small 0.00 (0.01)	middle 0.00 (0.00)	1.00 (19.00)	0.330
	small 0.00 (0.01)	large 0.00 (0.00)	-0.51 (35.24)	0.615
	middle 0.00 (0.01)	large 0.00 (0.00)	-2.18 (19.00)	0.042

Table C.26: Current education strategic purchasing personnal and company size

Education - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	small 0.01 (0.01)	middle 0.00 (0.01)	0.35 (31.72)	0.729
	small 0.01 (0.01)	large 0.00 (0.01)	1.30 (25.53)	0.206
	middle 0.01 (0.01)	large 0.00 (0.01)	1.33 (33.45)	0.192
technische Lehre	small 0.00 (0.01)	middle 0.00 (0.01)	0.74 (29.24)	0.466
	small 0.00 (0.01)	large 0.00 (0.00)	1.48 (22.12)	0.152
	middle 0.00 (0.01)	large 0.00 (0.00)	1.15 (28.95)	0.261
AHS	small 0.00 (0.00)	middle 0.00 (0.01)	-2.18 (19.00)	0.042
	small 0.00 (0.00)	large 0.00 (0.00)	-1.00 (19.00)	0.330
	middle 0.00 (0.00)	large 0.00 (0.00)	1.54 (27.15)	0.135
HAK	small 0.01 (0.01)	middle 0.01 (0.01)	0.20 (29.71)	0.841
	small 0.01 (0.01)	large 0.00 (0.01)	1.95 (25.73)	0.062
	middle 0.01 (0.01)	large 0.00 (0.01)	2.69 (35.68)	0.011

HTL	small 0.01 (0.01)	middle 0.01 (0.01)	-0.20 (30.43)	0.841
	small 0.01 (0.01)	large 0.01 (0.01)	0.34 (28.31)	0.733
	middle 0.01 (0.01)	large 0.01 (0.01)	0.80 (37.45)	0.426
Fachhochschule	small 0.01 (0.01)	middle 0.01 (0.01)	0.29 (31.48)	0.775
	small 0.01 (0.01)	large 0.01 (0.01)	-0.29 (29.00)	0.772
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.82 (37.30)	0.415
wirtschaftliches Universitätsstudium	small 0.01 (0.01)	middle 0.01 (0.01)	0.06 (31.77)	0.956
	small 0.01 (0.01)	large 0.01 (0.01)	-1.17 (25.96)	0.251
	middle 0.01 (0.01)	large 0.01 (0.01)	-1.77 (34.03)	0.085
technisches Universitätsstudium	small 0.00 (0.01)	middle 0.00 (0.01)	-1.16 (37.80)	0.253
	small 0.00 (0.01)	large 0.01 (0.01)	-2.52 (37.77)	0.016
	middle 0.00 (0.01)	large 0.01 (0.01)	-1.32 (38.00)	0.195
anderes Universitätsstudium	small NA (NA)	middle NA (NA)	NA (NA)	NA
	small 0.00 (0.00)	large 0.00 (0.01)	-2.85 (19.00)	0.010
	middle 0.00 (0.00)	large 0.00 (0.01)	-2.85 (19.00)	0.010
MBA	small 0.00 (0.01)	middle 0.00 (0.01)	0.59 (29.24)	0.562
	small 0.00 (0.01)	large 0.00 (0.01)	-0.21 (33.49)	0.831
	middle 0.00 (0.01)	large 0.00 (0.01)	-1.07 (36.16)	0.294

Table C.27: Current education operative purchasing personnal and supplier dependency

Education - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	weaker 0.02 (0.01)	stronger 0.01 (0.00)	3.75 (10.26)	0.004
technische Lehre	weaker 0.01 (0.01)	stronger 0.00 (0.00)	1.29 (10.32)	0.225
AHS	weaker 0.01 (0.01)	stronger 0.00 (0.00)	1.48 (10.26)	0.169
HAK	weaker 0.02 (0.01)	stronger 0.00 (0.00)	3.90 (10.31)	0.003
HTL	weaker 0.01 (0.01)	stronger 0.00 (0.00)	2.27 (10.26)	0.046
Fachhochschule	weaker 0.01 (0.01)	stronger 0.00 (0.00)	2.00 (10.21)	0.073
wirtschaftliches Universitätsstudium	weaker 0.01 (0.01)	stronger 0.00 (0.00)	1.52 (10.25)	0.160
technisches Universitätsstudium	weaker 0.00 (0.01)	stronger 0.00 (0.00)	1.27 (10.17)	0.233
anderes Universitätsstudium	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.76 (10.25)	0.462
MBA	weaker 0.00 (0.01)	stronger 0.00 (0.00)	1.36 (10.11)	0.204

Table C.28: Current education strategic purchasing personnal and supplier dependency

Education - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.37 (10.51)	0.721
technische Lehre	weaker 0.00 (0.00)	stronger 0.00 (0.00)	-2.83 (48.00)	0.007
AHS	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.79 (10.21)	0.449
HAK	weaker 0.01 (0.02)	stronger 0.00 (0.00)	2.30 (10.22)	0.044
HTL	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.75 (10.23)	0.020
Fachhochschule	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.19 (10.28)	0.263

wirtschaftliches Universitätsstudium	weaker 0.02 (0.02)	stronger 0.00 (0.00)	4.39 (10.28)	0.001
technisches Universitätsstudium	weaker 0.02 (0.02)	stronger 0.00 (0.00)	3.15 (10.15)	0.010
anderes Universitätsstudium	weaker 0.00 (0.00)	stronger 0.00 (0.00)	-2.59 (48.00)	0.013
MBA	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.58 (10.38)	0.577

Table C.29: Required education operative purchasing personnal and participant age

Req. Edu. - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	young 0.02 (0.01)	middle 0.01 (0.01)	0.95 (26.93)	0.350
	young 0.02 (0.01)	elder 0.01 (0.01)	0.52 (32.00)	0.604
	middle 0.02 (0.01)	elder 0.01 (0.01)	-0.42 (34.28)	0.677
technische Lehre	young 0.01 (0.01)	middle 0.00 (0.01)	0.69 (26.41)	0.496
	young 0.01 (0.01)	elder 0.01 (0.01)	0.04 (32.48)	0.967
	middle 0.01 (0.01)	elder 0.01 (0.01)	-0.72 (32.88)	0.476
AHS	young 0.01 (0.01)	middle 0.01 (0.01)	1.26 (25.41)	0.218
	young 0.01 (0.01)	elder 0.00 (0.01)	2.40 (20.67)	0.026
	middle 0.01 (0.01)	elder 0.00 (0.01)	1.69 (39.13)	0.099
HAK	young 0.02 (0.02)	middle 0.01 (0.01)	0.94 (27.22)	0.353
	young 0.02 (0.02)	elder 0.01 (0.01)	0.72 (31.96)	0.476
	middle 0.02 (0.02)	elder 0.01 (0.01)	-0.17 (34.68)	0.869

HTL	young 0.01 (0.01)	middle 0.01 (0.01)	-0.05 (29.48)	0.964
	young 0.01 (0.01)	elder 0.01 (0.01)	-0.28 (33.12)	0.781
	middle 0.01 (0.01)	elder 0.01 (0.01)	-0.29 (35.05)	0.776
Fachhochschule	young 0.00 (0.01)	middle 0.00 (0.00)	1.00 (16.00)	0.332
	young 0.00 (0.01)	elder 0.01 (0.01)	-1.22 (31.51)	0.232
	middle 0.00 (0.01)	elder 0.01 (0.01)	-2.19 (18.00)	0.042
wirtschaftliches Universitätsstudium	young NA (NA)	middle NA (NA)	NA (NA)	NA
	young 0.00 (0.00)	elder 0.00 (0.01)	-1.46 (18.00)	0.163
	middle 0.00 (0.00)	elder 0.00 (0.01)	-1.46 (18.00)	0.163
technisches Universitätsstudium	young NA (NA)	middle NA (NA)	NA (NA)	NA
	young 0.00 (0.00)	elder 0.00 (0.01)	-1.00 (18.00)	0.331
	middle 0.00 (0.00)	elder 0.00 (0.01)	-1.00 (18.00)	0.331
anderes Universitätsstudium	young NA (NA)	middle NA (NA)	NA (NA)	NA
	young NA (NA)	elder NA (NA)	NA (NA)	NA
	middle NA (NA)	elder NA (NA)	NA (NA)	NA
MBA	young NA (NA)	middle NA (NA)	NA (NA)	NA
	young NA (NA)	elder NA (NA)	NA (NA)	NA
	middle NA (NA)	elder NA (NA)	NA (NA)	NA

Table C.30: Required education strategic purchasing personnal and participant age

Req. Edu. - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	young 0.00 (0.01)	middle 0.00 (0.01)	0.48 (30.36)	0.634
	young 0.00 (0.01)	elder 0.00 (0.01)	0.22 (34.00)	0.825
	middle 0.00 (0.01)	elder 0.00 (0.01)	-0.21 (32.43)	0.835
technische Lehre	young 0.00 (0.00)	middle 0.00 (0.01)	-0.27 (36.87)	0.792
	young 0.00 (0.00)	elder 0.00 (0.00)	1.00 (16.00)	0.332
	middle 0.00 (0.00)	elder 0.00 (0.00)	1.45 (23.00)	0.162
AHS	young 0.00 (0.00)	middle 0.00 (0.00)	0.26 (29.89)	0.795
	young 0.00 (0.00)	elder 0.00 (0.01)	-0.75 (28.72)	0.460
	middle 0.00 (0.00)	elder 0.00 (0.01)	-0.98 (23.78)	0.338
HAK	young 0.01 (0.01)	middle 0.01 (0.01)	-0.83 (34.61)	0.414
	young 0.01 (0.01)	elder 0.01 (0.01)	-2.24 (32.26)	0.032
	middle 0.01 (0.01)	elder 0.01 (0.01)	-1.68 (31.06)	0.103
HTL	young 0.00 (0.01)	middle 0.01 (0.01)	-0.88 (36.36)	0.386
	young 0.00 (0.01)	elder 0.02 (0.01)	-4.39 (32.20)	<0.001
	middle 0.00 (0.01)	elder 0.02 (0.01)	-3.79 (32.89)	<0.001
Fachhochschule	young 0.01 (0.01)	middle 0.01 (0.01)	1.58 (34.30)	0.123
	young 0.01 (0.01)	elder 0.01 (0.01)	1.09 (32.98)	0.285
	middle 0.01 (0.01)	elder 0.01 (0.01)	-0.20 (32.08)	0.846

wirtschaftliches Universitätsstudium	young 0.02 (0.01)	middle 0.01 (0.01)	3.39 (38.02)	0.002
	young 0.02 (0.01)	elder 0.00 (0.01)	4.90 (34.00)	<0.001
	middle 0.02 (0.01)	elder 0.00 (0.01)	1.55 (40.08)	0.130
technisches Universitätsstudium	young 0.01 (0.01)	middle 0.00 (0.01)	1.81 (28.94)	0.081
	young 0.01 (0.01)	elder 0.00 (0.01)	2.75 (26.08)	0.011
	middle 0.01 (0.01)	elder 0.00 (0.01)	1.17 (41.00)	0.249
anderes Universitätsstudium	young 0.01 (0.01)	middle 0.00 (0.01)	0.98 (29.06)	0.336
	young 0.01 (0.01)	elder 0.00 (0.01)	1.64 (27.66)	0.113
	middle 0.01 (0.01)	elder 0.00 (0.01)	0.84 (40.63)	0.406
MBA	young 0.00 (0.00)	middle 0.00 (0.00)	0.26 (29.89)	0.795
	young 0.00 (0.00)	elder 0.00 (0.00)	1.00 (16.00)	0.332
	middle 0.00 (0.00)	elder 0.00 (0.00)	1.00 (23.00)	0.328

Table C.31: Required education operative purchasing personnal and participant education

Req. Edu. - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	apprenticeship 0.14 (0.00)	high school 0.02 (0.01)	55.14 (21.00)	<0.001
	apprenticeship 0.14 (0.00)	university 0.01 (0.01)	109.00 (34.00)	<0.001
	high school 0.14 (0.00)	university 0.01 (0.01)	3.07 (33.19)	0.004
technische Lehre	apprenticeship 0.00 (0.00)	high school 0.01 (0.01)	-2.81 (21.00)	0.011
	apprenticeship 0.00 (0.00)	university 0.00 (0.01)	-3.17 (34.00)	0.003
	high school 0.00 (0.00)	university 0.00 (0.01)	1.18 (30.49)	0.247

AHS	apprenticeship 0.00 (0.00)	high school 0.00 (0.01)	-1.82 (21.00)	0.083
	apprenticeship 0.00 (0.00)	university 0.00 (0.01)	-3.69 (34.00)	<0.001
	high school 0.00 (0.00)	university 0.00 (0.01)	-0.51 (38.73)	0.612
HAK	apprenticeship 0.10 (0.08)	high school 0.01 (0.01)	1.72 (2.01)	0.228
	apprenticeship 0.10 (0.08)	university 0.01 (0.01)	1.86 (2.00)	0.204
	high school 0.10 (0.08)	university 0.01 (0.01)	2.49 (31.91)	0.018
HTL	apprenticeship 0.05 (0.08)	high school 0.01 (0.01)	0.87 (2.01)	0.476
	apprenticeship 0.05 (0.08)	university 0.00 (0.01)	0.90 (2.00)	0.461
	high school 0.05 (0.08)	university 0.00 (0.01)	0.66 (32.53)	0.514
Fachhochschule	apprenticeship 0.05 (0.08)	high school 0.00 (0.00)	0.98 (2.00)	0.431
	apprenticeship 0.05 (0.08)	university 0.00 (0.00)	0.97 (2.00)	0.433
	high school 0.05 (0.08)	university 0.00 (0.00)	-0.17 (39.37)	0.867
wirtschaftliches Universitätsstudium	apprenticeship NA (NA)	high school NA (NA)	NA (NA)	NA
	apprenticeship 0.00 (0.00)	university 0.00 (0.00)	-1.44 (34.00)	0.160
	high school 0.00 (0.00)	university 0.00 (0.00)	-1.44 (34.00)	0.160
technisches Universitätsstudium	apprenticeship NA (NA)	high school NA (NA)	NA (NA)	NA
	apprenticeship 0.00 (0.00)	university 0.00 (0.00)	-1.00 (34.00)	0.324
	high school 0.00 (0.00)	university 0.00 (0.00)	-1.00 (34.00)	0.324
anderes Universitätsstudium	apprenticeship NA (NA)	high school NA (NA)	NA (NA)	NA
	apprenticeship NA (NA)	university NA (NA)	NA (NA)	NA
	high school NA (NA)	university NA (NA)	NA (NA)	NA

MBA	apprenticeship NA (NA)	high school NA (NA)	NA (NA)	NA
	apprenticeship NA (NA)	university NA (NA)	NA (NA)	NA
	high school NA (NA)	university NA (NA)	NA (NA)	NA

Table C.32: Required education strategic purchasing personnal and participant education

Req. Edu. - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	apprenticeship 0.08 (0.00)	high school 0.00 (0.01)	44.40 (21.00)	<0.001
	apprenticeship 0.08 (0.00)	university 0.00 (0.00)	174.41 (34.00)	<0.001
	high school 0.08 (0.00)	university 0.00 (0.00)	1.40 (23.93)	0.175
technische Lehre	apprenticeship 0.00 (0.00)	high school 0.00 (0.01)	-1.45 (21.00)	0.162
	apprenticeship 0.00 (0.00)	university 0.00 (0.00)	-1.00 (34.00)	0.324
	high school 0.00 (0.00)	university 0.00 (0.00)	1.19 (23.15)	0.245
AHS	apprenticeship 0.00 (0.00)	high school 0.00 (0.00)	-1.00 (21.00)	0.329
	apprenticeship 0.00 (0.00)	university 0.00 (0.00)	-1.79 (34.00)	0.083
	high school 0.00 (0.00)	university 0.00 (0.00)	0.06 (32.53)	0.953
HAK	apprenticeship 0.05 (0.04)	high school 0.02 (0.01)	1.36 (2.03)	0.304
	apprenticeship 0.05 (0.04)	university 0.00 (0.01)	1.86 (2.00)	0.203
	high school 0.05 (0.04)	university 0.00 (0.01)	5.45 (27.99)	<0.001
HTL	apprenticeship 0.05 (0.04)	high school 0.01 (0.01)	1.60 (2.04)	0.249
	apprenticeship 0.05 (0.04)	university 0.00 (0.01)	1.82 (2.01)	0.211
	high school 0.05 (0.04)	university 0.00 (0.01)	2.08 (27.36)	0.047

Fachhochschule	apprenticeship 0.05 (0.04)	high school 0.01 (0.01)	1.76 (2.03)	0.219
	apprenticeship 0.05 (0.04)	university 0.01 (0.01)	1.77 (2.01)	0.219
	high school 0.05 (0.04)	university 0.01 (0.01)	0.04 (29.05)	0.968
wirtschaftliches Universitätsstudium	apprenticeship 0.03 (0.04)	high school 0.01 (0.01)	0.76 (2.03)	0.525
	apprenticeship 0.03 (0.04)	university 0.01 (0.01)	0.78 (2.01)	0.517
	high school 0.03 (0.04)	university 0.01 (0.01)	0.17 (29.10)	0.863
technisches Universitätsstudium	apprenticeship 0.03 (0.04)	high school 0.00 (0.00)	0.96 (2.01)	0.438
	apprenticeship 0.03 (0.04)	university 0.00 (0.01)	0.85 (2.00)	0.484
	high school 0.03 (0.04)	university 0.00 (0.01)	-2.04 (48.45)	0.046
anderes Universitätsstudium	apprenticeship 0.03 (0.04)	high school 0.00 (0.00)	1.00 (2.00)	0.423
	apprenticeship 0.03 (0.04)	university 0.00 (0.00)	0.89 (2.00)	0.467
	high school 0.03 (0.04)	university 0.00 (0.00)	-3.43 (34.00)	0.002
MBA	apprenticeship 0.03 (0.04)	high school 0.00 (0.00)	1.00 (2.00)	0.423
	apprenticeship 0.03 (0.04)	university 0.00 (0.00)	0.99 (2.00)	0.427
	high school 0.03 (0.04)	university 0.00 (0.00)	-1.00 (34.00)	0.324

Table C.33: Required education operative purchasing personnal and company size

Req. Edu. - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	small 0.02 (0.01)	middle 0.01 (0.01)	1.83 (37.87)	0.075
	small 0.02 (0.01)	large 0.01 (0.01)	2.82 (37.83)	0.008
	middle 0.02 (0.01)	large 0.01 (0.01)	1.01 (38.00)	0.317

technische Lehre	small 0.01 (0.01)	middle 0.01 (0.01)	-1.02 (37.98)	0.316
	small 0.01 (0.01)	large 0.00 (0.01)	1.10 (31.43)	0.278
	middle 0.01 (0.01)	large 0.00 (0.01)	2.31 (31.05)	0.028
AHS	small 0.00 (0.01)	middle 0.00 (0.01)	-0.65 (37.59)	0.521
	small 0.00 (0.01)	large 0.01 (0.01)	-1.64 (35.73)	0.109
	middle 0.00 (0.01)	large 0.01 (0.01)	-1.01 (37.15)	0.320
HAK	small 0.01 (0.01)	middle 0.01 (0.01)	0.22 (36.87)	0.824
	small 0.01 (0.01)	large 0.01 (0.01)	-0.26 (36.28)	0.795
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.54 (37.93)	0.591
HTL	small 0.01 (0.01)	middle 0.01 (0.01)	-0.39 (37.92)	0.696
	small 0.01 (0.01)	large 0.01 (0.01)	-0.97 (38.00)	0.339
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.60 (37.93)	0.554
Fachhochschule	small 0.00 (0.00)	middle 0.00 (0.01)	-1.45 (19.00)	0.163
	small 0.00 (0.00)	large 0.00 (0.01)	-1.83 (19.00)	0.083
	middle 0.00 (0.00)	large 0.00 (0.01)	-0.44 (37.17)	0.662
wirtschaftliches Universitätsstudium	small 0.00 (0.01)	middle 0.00 (0.00)	1.00 (19.00)	0.330
	small 0.00 (0.01)	large 0.00 (0.01)	0.14 (36.50)	0.886
	middle 0.00 (0.01)	large 0.00 (0.01)	-1.00 (19.00)	0.330
technisches Universitätsstudium	small NA (NA)	middle NA (NA)	NA (NA)	NA
	small 0.00 (0.00)	large 0.00 (0.01)	-1.00 (19.00)	0.330
	middle 0.00 (0.00)	large 0.00 (0.01)	-1.00 (19.00)	0.330

anderes Universitätsstudium	small NA (NA)	middle NA (NA)	NA (NA)	NA
	small NA (NA)	large NA (NA)	NA (NA)	NA
	middle NA (NA)	large NA (NA)	NA (NA)	NA
MBA	small NA (NA)	middle NA (NA)	NA (NA)	NA
	small NA (NA)	large NA (NA)	NA (NA)	NA
	middle NA (NA)	large NA (NA)	NA (NA)	NA

Table C.34: Required education strategic purchasing personnal and company size

Req. Edu. - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	small 0.01 (0.01)	middle 0.00 (0.01)	0.76 (30.90)	0.452
	small 0.01 (0.01)	large 0.00 (0.00)	2.18 (19.00)	0.042
	middle 0.01 (0.01)	large 0.00 (0.00)	2.18 (19.00)	0.042
technische Lehre	small 0.00 (0.01)	middle 0.00 (0.01)	-0.14 (36.54)	0.886
	small 0.00 (0.01)	large 0.00 (0.00)	1.00 (19.00)	0.330
	middle 0.00 (0.01)	large 0.00 (0.00)	1.45 (19.00)	0.163
AHS	small 0.00 (0.00)	middle 0.00 (0.01)	-1.45 (19.00)	0.163
	small 0.00 (0.00)	large 0.00 (0.01)	-1.45 (19.00)	0.163
	middle 0.00 (0.00)	large 0.00 (0.01)	-0.07 (37.81)	0.943
HAK	small 0.02 (0.01)	middle 0.01 (0.01)	2.09 (31.19)	0.045
	small 0.02 (0.01)	large 0.01 (0.01)	3.13 (30.96)	0.004
	middle 0.02 (0.01)	large 0.01 (0.01)	1.42 (37.99)	0.163

HTL	small 0.01 (0.01)	middle 0.01 (0.01)	0.41 (31.78)	0.681
	small 0.01 (0.01)	large 0.01 (0.01)	0.24 (33.12)	0.810
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.22 (37.81)	0.830
Fachhochschule	small 0.01 (0.01)	middle 0.01 (0.01)	0.03 (32.54)	0.979
	small 0.01 (0.01)	large 0.01 (0.01)	-0.39 (33.77)	0.698
	middle 0.01 (0.01)	large 0.01 (0.01)	-0.54 (37.84)	0.595
wirtschaftliches Universitätsstudium	small 0.01 (0.01)	middle 0.01 (0.01)	-1.11 (34.96)	0.276
	small 0.01 (0.01)	large 0.01 (0.01)	-1.01 (36.17)	0.320
	middle 0.01 (0.01)	large 0.01 (0.01)	0.08 (37.79)	0.936
technisches Universitätsstudium	small 0.00 (0.01)	middle 0.00 (0.01)	-1.27 (37.02)	0.211
	small 0.00 (0.01)	large 0.01 (0.01)	-2.34 (33.99)	0.025
	middle 0.00 (0.01)	large 0.01 (0.01)	-1.15 (36.66)	0.259
anderes Universitätsstudium	small 0.00 (0.00)	middle 0.00 (0.01)	-1.83 (19.00)	0.083
	small 0.00 (0.00)	large 0.01 (0.01)	-3.20 (19.00)	0.005
	middle 0.00 (0.00)	large 0.01 (0.01)	-1.58 (33.96)	0.125
MBA	small 0.00 (0.00)	middle 0.00 (0.00)	-1.00 (19.00)	0.330
	small 0.00 (0.00)	large 0.00 (0.00)	-1.00 (19.00)	0.330
	middle 0.00 (0.00)	large 0.00 (0.00)	-0.05 (37.81)	0.961

Table C.35: Required education operative purchasing personnal and supplier dependency

Req. Edu. - Op. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	weaker 0.03 (0.02)	stronger 0.01 (0.01)	4.17 (10.29)	0.002
technische Lehre	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.01 (10.29)	0.337
AHS	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.05 (10.28)	0.319
HAK	weaker 0.02 (0.02)	stronger 0.01 (0.01)	2.68 (10.24)	0.023
HTL	weaker 0.01 (0.02)	stronger 0.00 (0.00)	0.85 (10.35)	0.415
Fachhochschule	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.78 (10.21)	0.451
wirtschaftliches Universitätsstudium	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.95 (10.06)	0.367
technisches Universitätsstudium	weaker 0.00 (0.01)	stronger 0.00 (0.00)	1.00 (10.00)	0.341
anderes Universitätsstudium	weaker NA (NA)	stronger NA (NA)	NA (NA)	NA
MBA	weaker NA (NA)	stronger NA (NA)	NA (NA)	NA

Table C.36: Required education strategic purchasing personnal and supplier dependency

Req. Edu. - Strat. Purch.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
kaufmännische Lehre	weaker 0.01 (0.01)	stronger 0.00 (0.00)	1.23 (10.19)	0.246
technische Lehre	weaker 0.00 (0.00)	stronger 0.00 (0.00)	-1.77 (48.00)	0.083
AHS	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.83 (10.18)	0.428
HAK	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.09 (10.27)	0.063
HTL	weaker 0.02 (0.02)	stronger 0.00 (0.00)	3.48 (10.28)	0.006
Fachhochschule	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.05 (10.34)	0.317

wirtschaftliches Universitätsstudium	weaker 0.02 (0.02)	stronger 0.00 (0.00)	2.22 (10.26)	0.050
technisches Universitätsstudium	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.53 (10.23)	0.157
anderes Universitätsstudium	weaker 0.01 (0.02)	stronger 0.00 (0.00)	1.67 (10.16)	0.125
MBA	weaker 0.00 (0.01)	stronger 0.00 (0.00)	0.94 (10.06)	0.368

Table C.37: Skills now and company size

Skills	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Independent way of working	small 4.50 (0.51)	middle 4.50 (0.51)	0.00 (38.00)	1.000
	small 4.50 (0.51)	large 4.45 (0.60)	0.28 (37.01)	0.780
	middle 4.50 (0.51)	large 4.45 (0.60)	0.28 (37.01)	0.780
Negotiation skills	small 4.40 (0.68)	middle 4.30 (0.66)	0.47 (37.95)	0.639
	small 4.40 (0.68)	large 4.45 (0.51)	-0.26 (35.24)	0.794
	middle 4.40 (0.68)	large 4.45 (0.51)	-0.81 (35.81)	0.425
Communication skills	small 4.40 (0.60)	middle 4.10 (0.64)	1.53 (37.82)	0.134
	small 4.40 (0.60)	large 4.45 (0.60)	-0.26 (38.00)	0.794
	middle 4.40 (0.60)	large 4.45 (0.60)	-1.78 (37.87)	0.084
Purchasing know-how	small 4.35 (0.67)	middle 4.35 (0.67)	0.00 (38.00)	1.000
	small 4.35 (0.67)	large 4.20 (0.70)	0.69 (37.95)	0.492
	middle 4.35 (0.67)	large 4.20 (0.70)	0.69 (37.95)	0.492

Ability to cope with pressure	small 4.20 (0.70)	middle 4.40 (0.60)	-0.97 (37.16)	0.336
	small 4.20 (0.70)	large 4.20 (0.62)	0.00 (37.44)	1.000
	middle 4.20 (0.70)	large 4.20 (0.62)	1.04 (37.97)	0.304
Teamwork capacity	small 4.20 (0.62)	middle 4.10 (0.72)	0.47 (37.13)	0.639
	small 4.20 (0.62)	large 4.10 (0.55)	0.54 (37.56)	0.592
	middle 4.20 (0.62)	large 4.10 (0.55)	0.00 (35.66)	1.000
English	small 4.00 (0.79)	middle 3.95 (0.89)	0.19 (37.55)	0.852
	small 4.00 (0.79)	large 4.05 (1.00)	-0.18 (36.18)	0.862
	middle 4.00 (0.79)	large 4.05 (1.00)	-0.33 (37.48)	0.740
Production know-how	small 3.90 (0.72)	middle 4.00 (0.79)	-0.42 (37.62)	0.679
	small 3.90 (0.72)	large 3.50 (0.89)	1.57 (36.40)	0.126
	middle 3.90 (0.72)	large 3.50 (0.89)	1.88 (37.54)	0.068
Conflict management skills	small 3.50 (0.89)	middle 3.60 (1.05)	-0.33 (37.03)	0.746
	small 3.50 (0.89)	large 4.15 (0.81)	-2.41 (37.70)	0.021
	middle 3.50 (0.89)	large 4.15 (0.81)	-1.86 (35.81)	0.072
Technological know-how	small 3.50 (0.69)	middle 4.00 (0.56)	-2.52 (36.54)	0.016
	small 3.50 (0.69)	large 3.75 (0.91)	-0.98 (35.37)	0.334
	middle 3.50 (0.69)	large 3.75 (0.91)	1.04 (31.64)	0.304
Legal know-how	small 3.30 (0.98)	middle 3.65 (0.99)	-1.13 (38.00)	0.267
	small 3.30 (0.98)	large 3.70 (0.73)	-1.46 (35.21)	0.152
	middle 3.30 (0.98)	large 3.70 (0.73)	-0.18 (35.04)	0.857

IT know-how	small 3.40 (0.94)	middle 3.60 (0.60)	-0.80 (32.22)	0.428
	small 3.40 (0.94)	large 3.60 (0.68)	-0.77 (34.62)	0.446
	middle 3.40 (0.94)	large 3.60 (0.68)	0.00 (37.39)	1.000
Project management skills	small 3.20 (1.01)	middle 3.40 (0.99)	-0.63 (38.00)	0.531
	small 3.20 (1.01)	large 3.45 (0.76)	-0.89 (35.35)	0.381
	middle 3.20 (1.01)	large 3.45 (0.76)	-0.18 (35.53)	0.859
Presentation skills	small 3.25 (1.02)	middle 3.35 (0.99)	-0.31 (37.96)	0.754
	small 3.25 (1.02)	large 3.25 (1.02)	0.00 (38.00)	1.000
	middle 3.25 (1.02)	large 3.25 (1.02)	0.31 (37.96)	0.754
Additional foreign languages	small 2.50 (0.89)	middle 2.50 (0.95)	0.00 (37.85)	1.000
	small 2.50 (0.89)	large 2.45 (1.00)	0.17 (37.49)	0.868
	middle 2.50 (0.89)	large 2.45 (1.00)	0.16 (37.89)	0.872

Table C.38: Skills now and company size

Skills	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Ability to cope with pressure	small 3.90 (0.79)	middle 3.90 (0.64)	0.00 (36.48)	1.000
	small 3.90 (0.79)	large 3.85 (0.67)	0.22 (37.05)	0.830
	middle 3.90 (0.79)	large 3.85 (0.67)	0.24 (37.92)	0.811
English	small 3.75 (0.79)	middle 4.10 (0.64)	-1.54 (36.51)	0.131
	small 3.75 (0.79)	large 3.75 (0.64)	0.00 (36.47)	1.000
	middle 3.75 (0.79)	large 3.75 (0.64)	1.73 (38.00)	0.092

Communication skills	small 3.75 (0.72)	middle 3.90 (0.64)	-0.70 (37.54)	0.489
	small 3.75 (0.72)	large 3.70 (0.66)	0.23 (37.72)	0.819
	middle 3.75 (0.72)	large 3.70 (0.66)	0.97 (37.98)	0.336
Legal know-how	small 3.75 (0.64)	middle 3.75 (0.64)	0.00 (38.00)	1.000
	small 3.75 (0.64)	large 3.65 (0.67)	0.48 (37.91)	0.632
	middle 3.75 (0.64)	large 3.65 (0.67)	0.48 (37.91)	0.632
Technological know-how	small 3.80 (0.70)	middle 3.85 (0.59)	-0.25 (36.95)	0.807
	small 3.80 (0.70)	large 3.45 (0.51)	1.81 (34.86)	0.078
	middle 3.80 (0.70)	large 3.45 (0.51)	2.30 (37.28)	0.027
Project management skills	small 3.80 (0.62)	middle 3.65 (0.75)	0.69 (36.69)	0.492
	small 3.80 (0.62)	large 3.55 (0.69)	1.21 (37.56)	0.233
	middle 3.80 (0.62)	large 3.55 (0.69)	0.44 (37.75)	0.661
Independent way of working	small 3.75 (0.79)	middle 3.75 (0.64)	0.00 (36.47)	1.000
	small 3.75 (0.79)	large 3.40 (0.68)	1.51 (37.23)	0.141
	middle 3.75 (0.79)	large 3.40 (0.68)	1.68 (37.85)	0.102
Conflict management skills	small 3.65 (0.75)	middle 3.65 (0.81)	0.00 (37.72)	1.000
	small 3.65 (0.75)	large 3.60 (0.50)	0.25 (33.32)	0.805
	middle 3.65 (0.75)	large 3.60 (0.50)	0.23 (31.68)	0.816
Purchasing know-how	small 3.80 (0.70)	middle 3.60 (0.50)	1.04 (34.58)	0.305
	small 3.80 (0.70)	large 3.45 (0.60)	1.70 (37.28)	0.098
	middle 3.80 (0.70)	large 3.45 (0.60)	0.85 (36.77)	0.399

Production know-how	small 3.75 (0.64)	middle 3.60 (0.60)	0.77 (37.84)	0.448
	small 3.75 (0.64)	large 3.40 (0.50)	1.93 (36.01)	0.062
	middle 3.75 (0.64)	large 3.40 (0.50)	1.14 (36.90)	0.260
Additional foreign languages	small 3.55 (0.69)	middle 3.75 (0.64)	-0.95 (37.80)	0.346
	small 3.55 (0.69)	large 3.35 (0.67)	0.93 (37.98)	0.357
	middle 3.55 (0.69)	large 3.35 (0.67)	1.93 (37.91)	0.061
Negotiation skills	small 3.65 (0.67)	middle 3.65 (0.67)	0.00 (38.00)	1.000
	small 3.65 (0.67)	large 3.35 (0.59)	1.50 (37.34)	0.141
	middle 3.65 (0.67)	large 3.35 (0.59)	1.50 (37.34)	0.141
Teamwork capacity	small 3.60 (0.60)	middle 3.45 (0.51)	0.85 (37.08)	0.399
	small 3.60 (0.60)	large 3.50 (0.61)	0.52 (37.99)	0.603
	middle 3.60 (0.60)	large 3.50 (0.61)	-0.28 (36.91)	0.780
IT know-how	small 3.40 (0.68)	middle 3.55 (0.60)	-0.74 (37.48)	0.466
	small 3.40 (0.68)	large 3.55 (0.51)	-0.79 (35.24)	0.436
	middle 3.40 (0.68)	large 3.55 (0.51)	0.00 (36.96)	1.000
Presentation skills	small 3.35 (0.59)	middle 3.55 (0.69)	-0.99 (37.11)	0.328
	small 3.35 (0.59)	large 3.50 (0.61)	-0.79 (37.96)	0.432
	middle 3.35 (0.59)	large 3.50 (0.61)	0.24 (37.44)	0.809

Table C.39: Skills in 10 years and supplier dependency

Skills	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Independent way of working	weaker 4.64 (0.50)	stronger 4.45 (0.54)	1.10 (15.64)	0.289
Negotiation skills	weaker 4.64 (0.50)	stronger 4.33 (0.63)	1.76 (17.65)	0.096
Communication skills	weaker 4.45 (0.52)	stronger 4.29 (0.65)	0.93 (17.60)	0.367
Purchasing know-how	weaker 4.27 (0.65)	stronger 4.31 (0.68)	-0.15 (15.44)	0.880
Ability to cope with pressure	weaker 4.36 (0.67)	stronger 4.24 (0.63)	0.53 (14.19)	0.602
Teamwork capacity	weaker 4.18 (0.75)	stronger 4.12 (0.60)	0.25 (13.01)	0.810
English	weaker 4.27 (0.79)	stronger 3.94 (0.90)	1.24 (16.44)	0.233
Production know-how	weaker 3.55 (0.52)	stronger 3.86 (0.87)	-1.56 (24.23)	0.133
Conflict management skills	weaker 4.00 (1.00)	stronger 3.69 (0.94)	0.93 (14.24)	0.369
Technological know-how	weaker 3.73 (0.47)	stronger 3.76 (0.80)	-0.15 (25.40)	0.880
Legal know-how	weaker 3.27 (1.10)	stronger 3.61 (0.86)	-0.96 (12.87)	0.356
IT know-how	weaker 3.27 (1.19)	stronger 3.59 (0.61)	-0.86 (11.20)	0.406
Project management skills	weaker 3.09 (1.14)	stronger 3.41 (0.86)	-0.87 (12.72)	0.400
Presentation skills	weaker 3.36 (1.12)	stronger 3.27 (0.97)	0.27 (13.60)	0.792
Additional foreign languages	weaker 2.82 (0.60)	stronger 2.41 (0.98)	1.79 (23.56)	0.087

Table C.40: Skills in 10 years and supplier dependency

Skills.	Group 1 $\mu(\sigma)$	Group 2 $\mu(\sigma)$	t (df)	p
Ability to cope with pressure	weaker 3.82 (0.75)	stronger 3.90 (0.68)	-0.32 (13.98)	0.751
English	weaker 4.09 (0.70)	stronger 3.82 (0.70)	1.18 (14.79)	0.258
Communication skills	weaker 4.00 (0.77)	stronger 3.73 (0.64)	1.06 (13.22)	0.309
Legal know-how	weaker 3.73 (0.65)	stronger 3.71 (0.65)	0.06 (14.82)	0.953
Technological know-how	weaker 3.82 (0.60)	stronger 3.67 (0.63)	0.71 (15.23)	0.486
Project management skills	weaker 3.73 (0.65)	stronger 3.65 (0.69)	0.34 (15.62)	0.739
Independent way of working	weaker 3.73 (0.79)	stronger 3.61 (0.70)	0.45 (13.80)	0.662
Conflict management skills	weaker 3.73 (0.79)	stronger 3.61 (0.67)	0.45 (13.47)	0.660
Purchasing know-how	weaker 3.55 (0.69)	stronger 3.63 (0.60)	-0.39 (13.65)	0.704
Production know-how	weaker 3.82 (0.40)	stronger 3.53 (0.62)	1.91 (21.88)	0.069
Additional foreign languages	weaker 4.00 (0.63)	stronger 3.45 (0.65)	2.60 (15.09)	0.020
Negotiation skills	weaker 3.82 (0.87)	stronger 3.49 (0.58)	1.19 (12.06)	0.257
Teamwork capacity	weaker 3.64 (0.67)	stronger 3.49 (0.54)	0.67 (13.09)	0.512
IT know-how	weaker 3.55 (0.82)	stronger 3.49 (0.54)	0.21 (12.05)	0.834
Presentation skills	weaker 3.64 (0.50)	stronger 3.43 (0.65)	1.17 (18.19)	0.258