Competency Requirements on Procurement Beyond 2010
-A case study on Siemens Industrial Turbomachinery in Finspong & Lincoln-

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Competency Requirements on Procurement beyond 2010 – A Case Study on Siemens Industrial Turbomachinery in Finspong & Lincoln

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Abstract

The purpose of this thesis is to analyse long term future requirements on function profiles within procurement at Siemens PGI4, in terms of competencies needed for crucial roles. The future requirements will be based on ongoing macroeconomic trends and the specific conditions for Siemens PGI4.

Competency requirements in consequence of trends like the globalisation, information technology and corporate social responsibility, were identified. In order to assess the gap between current level of competency and the required future level, questionnaires were compiled for the different function profiles within I4 Procurement. Based on the analysis of the gaps, recommendations regarding competencies and roles in need of development were formulated.

Nyckelord
Keyword

Purchasing, procurement, purchasing process, macroeconomic trends, globalisation, outsourcing, information technology, corporate social responsibility, changing consumer patterns, future competency requirements, competency development, Siemens
Abstract
This Master’s thesis was commissioned by Siemens Industrial Turbomachinery, subdivision Industrial Gas Turbines (PGI4) in Finspong, Sweden, and in Lincoln, England. The company has been part of Siemens Power Generation Industrial Applications since its acquisition in 2003. In this connection, the strategic importance of procurement became more recognised and the procurement organisation has undergone many changes. Procurement, however, is a function very much affected by changes in the business context, making constant adaptations and transformations necessary.

In order to ensure that the procurement organisations in Finspong and Lincoln are well prepared for future challenges, the purchasing director at Siemens PGI4 asked us to investigate competency requirements on procurement beyond the year 2010, based on the impact of macroeconomic trends. Furthermore, a gap analysis was requested in order to compare the current competency level with the required future competency level.

The task was approached by studying literature and interviewing well-known purchasing professors. From this we concluded that the macroeconomic trends of greatest relevance for Siemens PGI4 are globalisation, outsourcing, development of information technology, increasing demands on corporate social responsibility and changing consumer patterns. Our investigation of the impact of these trends on procurement resulted in several requirements for the future. For example, risks must be managed throughout the whole supply chain, as the complexity of supply increases as a result of globalisation and outsourcing. The requirements are presented in terms of competencies and roles that need to be assumed.

We mapped the current competency level by means of questionnaires filled in by the personnel concerned. We then compared this with the required future level. The gap analysis indicated that gaps within management of relations, for example, exist for several of the studied function profiles and that today’s way of handling risks will not be sufficient in the future. Still, the majority of the competency gaps are not very large. We believe therefore that by taking care of the existing gaps and installing a supply chain risk management team, the procurement function can live up to the future requirements until the year 2010. We recommend the identified crucial roles and competencies to be taken into consideration when recruiting new employees and when developing existing personnel. However, continuous review and update of competencies will be needed in order to keep the company competitive.
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1 Introduction
In this chapter, the reader is introduced to the background of the thesis and the purpose is presented. Also, the directives given by the sponsor of the thesis are stated.

1.1 Background
Companies of today experience important changes within the business context. These changes have many explanations. The globalisation of trade is increasing, leading to a more fierce competition between companies. The rapid development of information technology enables new ways of business transactions.1, 2 Changing consumer patterns, leading to increased demands on for example cycle times and after-sales service, is also a challenge for companies3. The way low-wage countries compete on the global market is in contradiction to a sustainable development and is likely to be more limited in the near future4. This puts focus on corporate social responsibility.

To be able to compete on a global market, companies need to adapt to the trends mentioned above. To contribute to competitive advantage, procurement has an important task in reducing costs and is nowadays considered a key function within most companies. In fact, procurement can also have a positive impact on the revenue side of the company, by gaining advantage of the suppliers’ resources and technology5. In this changing environment procurement has to meet new requirements. Both the role of the staff and their way of working is changing, demanding new competencies among them.

Siemens PGI4, being an actor on the global market, is highly affected by the mentioned trends. The purchasing director of PGI4, who is the sponsor of this thesis, has therefore asked us to study future competency requirements for the procurement function. Since the establishment of Siemens PGI4 in Lincoln and Finspong, these two locations belong to the same sub division and have the same purchasing director. His ambition is that both locations will meet future competency requirements.

The purchasing-to-sales ratio for Siemens PGI4 is approximately 65-70%, some percent lower for Lincoln than for Finspong. This high ratio makes the procurement function at Siemens PGI4 very important.

Since the acquisition by Siemens, the position of procurement has strengthened; it has become part of the top management of Siemens PGI4 and more people with high education have been employed. Our task is to come up with long term future competency requirements for different profiles within the function. The results are to be used for

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1 Axelsson B. (2005-09-30)
2 van Weele A. (2005-10-18)
3 Ibid.
4 Axelsson B. (2005-09-30)
5 Gadde L-E and Håkansson H, (2001)
recruitments and development of existing personnel, in order to meet future competency requirements.

1.2 Purpose
The purpose of this thesis is to analyse long term future requirements on function profiles within procurement at Siemens PGI4, in terms of competencies needed for crucial roles. The future requirements will be based on ongoing macroeconomic trends and the specific conditions for Siemens PGI4.

1.3 Directives
The following directives were given by the purchasing director at PGI4, who is the sponsor of this thesis.

I. The study shall include procurement at PGI4 in Finspong and Lincoln and exclude the organisations in Houston and St. Petersburg, also part of PGI4
II. A gap analysis shall be performed, comparing the competency gaps for the two studied locations
III. The competency requirements shall focus on long term future needs, that is beyond the year 2010. The study shall focus on competencies required as a result of ongoing trends. Competencies not affected by these trends will therefore not be addressed.
IV. The result of this study shall not demonstrate competency gaps on an individual level

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6 van Weele defines a role as tasks, responsibilities and competencies (van Weele, 2005).
2 Present Situation

In this chapter, the present situation at Siemens PGI4 in Finspong and Lincoln is described. The information is based on, interviews with various people within the organisation and from several internal documents.

2.1 Introduction to Siemens

Siemens is a multi national company with many different lines of businesses. Siemens has roughly 430,000 employees worldwide and in 2004 a turnover at approximately € 75.2 billions was returned. The company is divided into six business areas. The areas and their respective share of the turnover are seen in figure 2.1 below.

![Figure 2.1: The six business areas showing sales share per segment.](image)

Industrial Applications is one of the divisions of Siemens Power Generation. It was established in 2003 after Siemens’ acquisition of parts of Alstom’s industrial applications, including the assembly works in Lincoln and Finspong. The reason for the purchase was that Siemens wanted to have all the sizes of turbines into their product portfolio. Before, they had large turbines covered, but since the acquisition they also have small and medium sized. Having this wider range of turbines, Siemens hopes to better compete on the global market.

Industrial Applications consists of six sub divisions, so called GZs, as seen in figure 2.2. This thesis will focus on Power Generation Industrial application, sub division four (PGI4). PGI4 is represented in Finspong, Lincoln, Houston and St. Petersburg, but the thesis will focus on Finspong and Lincoln only, from now on referred to as I4. At both these locations all GZs except I3 are represented.
2.2 Products of I4

I4 manufactures gas turbines for single cycle and combined cycle power plants configured to the customer’s specific requirements. The turbines are either used to generate power or for mechanical drive.

Small gas turbines with less than 15 MW power are produced in Lincoln and medium sized gas turbines with between 17 and 43 MW power are produced in Finspong. Today, I4 in Finspong is busy producing high volumes because of increased customer demand. The output is forecasted to increase from 42 to 83 turbines from fiscal year 2004/2005 to fiscal year 2007/2008. This growth is very much affecting procurement, which has strengthened its staffing to respond to the increased work load. In contrast, I4 in Lincoln has problems to reach the desired sales volume, and hence the work load for procurement in Lincoln is lower.

2.2.1 The Gas Turbine Market

I4 in Lincoln has problems with costs, quality and delivery times, and has therefore lost market shares to its competitors. On the market segments where I4 is active, they are up against two very dominant competitors. On the small gas turbine market, Solar has a market share of around 70%, and on the medium gas turbine market, General Electric has around 60%. At the moment, I4 in Lincoln is loosing market shares to Solar, whereas I4 in Finspong is gaining on General Electric.

The gas turbines of I4 are either sold internally to Power Plants (I5) or Oil & Gas (I6) or directly to the industrial power generation market. The end customers are spread all over the world. The turbines are used for generating electricity, steam and heat, and also to work pumps and compressors in the oil- and gas market.

2.3 Procurement at PG I

The procurement function at I4 will from now on be referred to as I4 Procurement. A description of how this function is organised and of its strategies will now follow. While reading this chapter, it may be of use to refer to appendix 1, where a list of internal Siemens terms can be found.

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7 Internal Siemens document
I4 Procurement is handled both centrally and locally. This has been the structure since the acquisition by Siemens in 2003 and has, apart from organisational changes, involved relational changes too. The subdivisions in Finspong and Lincoln used to work together before, but not at all to such a large extent as today. Now, the two locations have a single purchasing director who co-ordinates procurement activities. A Supply Management organisation called IBS is centrally monitoring commodities which are considered to be strategic at PG I, so-called key commodities. These commodities make up about 45-50% of total purchasing and the purpose with IBS is to make Siemens PG I benefit from synergies between different GZs. IBS is divided into seven units, one for each GZ and one for Controlling/Methods. This organisation is illustrated in figure 2.3.

![Figure 2.3: Organisation of IBS.](8)

As shown in figure 2.4 below, IBS’s responsibility includes the strategic parts of the purchasing process, whereas operative tasks are handled by the Purchasing organisations, IBP. IBP is also monitoring non-strategic commodities. These are handled locally by buyers and senior buyers who then are responsible for the whole purchasing process.

![Figure 2.4: The purchasing process at Siemens PG I.](9)

The responsibilities within PG I Procurement are divided into Procurement Directing, Procurement Buying, Procurement Controlling and Procurement Engineering. As shown in figure 2.5 below, these functions consist of many different function profiles. Employees having the same kind of responsibilities are assigned the same function profile. These

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8 Adapted from internal document
9 Adapted from internal document
function profiles are described in detail in chapter 6 by means of interviews, questionnaire answers and existing job profiles.

The primary Purchasing function at I4 is divided into Core Engine and Packaging. These departments exist both in Finspong and in Lincoln, although there are some differences between the two locations. A description of the two departments will now follow, and the differences between Finspong and Lincoln will be sorted out.

### 2.3.1 Core Engine and Packaging in Finspong and Lincoln

Each of the Core Engine and Packaging departments is managed by a purchasing manager. The manager is, together with senior buyers, buyers and supplier development engineers, responsible for the supply of materials and components for the core or the peripheral equipment (for example air intake) of the gas turbine. To minimise lead time to customer, the core of the turbine is manufactured according to a forecasted demand. Peripheral equipment is adjusted to the customer’s requirements and hence are not purchased until a turbine has been assigned to a customer. In Finspong, peripheral equipment is mainly purchased as whole systems which are only assembled on the turbine, whereas buyers in Lincoln are purchasing bits and pieces which then are worked up in the own workshop before being assembled on a turbine. Buying whole systems make operative tasks more

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10 Adapted from internal document
complex since every system is unique. Therefore, operative and strategic work at Packaging in Finspong has not been separated between buyers and senior buyers as it is at Core Engine in Finspong. The operative tasks at Core Engine in Finspong are performed by buyers who belong to production and have their own manager.

As stated above, purchasing at Packaging is less complex in Lincoln than in Finspong. Still, neither Packaging nor Core Engine in Lincoln has separated strategic and operative tasks between buyers and senior buyers. This organisation is, according to managers in Lincoln, due to traditional reasons, and all managers in Lincoln are not satisfied with the way responsibility is divided today. Another difference at I4 Procurement in Lincoln compared to Finspong is that the responsibility for orders is transferred to material schedulers when the order has been processed. They are expediting for both Core Engine and Packaging and belong to different manufacturing groups in the production, depending on which production process they are expediting for.

Some part of the manufacturing volume is always subcontracted, and during times of increasing work load, the subcontracted volume increases. By always subcontracting part of the volume, the subcontractor’s knowledge about the products is kept fresh. Presently, the volume for Core Engine in Finspong has increased so much that both the own manufacturing capacity and the subcontractors’ capacity are fully used. Senior buyers at Core Engine in Finspong are therefore busy finding new suppliers.

There is a goal to increase output in Finspong from 42 turbines in fiscal year 2004/2005 to 83 turbines in fiscal year 2007/2008. This rapid increase has consequences for the delivery service to production. At I4 Procurement, delivery service is defined to fulfil the customers’ demands on delivery time, quantity and quality. This service to production has never been higher than 70% for neither Core Engine nor Packaging in Finspong. However, the time margins in the production have been high enough to enable the desired delivery service to end customers. When the volumes increase, production can not keep as high margins anymore and the delivery service from I4 Procurement in Finspong therefore has to improve.

As mentioned in chapter 2.2.1, the problem for I4 in Lincoln are decreasing sales volumes rather than increasing volumes. Still, according to their manufacturing plan, the amount of manufactured gas turbines will increase from 49 in fiscal year 2004/2005 to 100 in fiscal year 2007/2008.

2.3.2 I4 Procurement in Relation to Service (I1) and Oil & Gas (I6)
Besides buying parts to the production of new turbines at I4, I4 Procurement is also responsible for a large share of the purchases to I1 and I6. 30-40% of the purchases to I1 are carried out by I4. For I6 in Finspong nearly 100% of the purchases are carried out by I4 Procurement and the major part of the purchases in Lincoln. These departments are therefore widely affected by the performance of I4 Procurement.
There are somewhat different priorities between the different GZs, which may lead to conflicts. The manufacturing of gas turbines at I4 requires excellent quality and as low price as possible to make the turbines competitive. I1 on the other hand, prioritizes short lead time, whereas an understanding for the customers’ needs is required when supplying I6 with components. The purchasing managers at I1 in both Finspong and Lincoln have some complaints about I4 Procurement’s lack of ability to take Service’s priorities into consideration when choosing supplier and drawing up contracts. Also I6 has complaints about the buyers’ holistic view. According to the purchasing co-ordinator at I6 in Lincoln, the products of I6 are more adjusted to the customers’ needs than the more standardised products of I4, and many buyers need to improve their understanding for what the customer needs. Since I4 Procurement is responsible for supply of material to GZs having different priorities, a holistic view is very important.

### 2.3.3 Procurement Strategies at I4

To explore the future requirements of procurement, it is important to look at the current strategies. The strategies are interesting since any changes within an organisation should be supported by the overall strategies. A strategy looks some years forward and therefore implies what development is needed in order to reach the strategy goals. When future competency requirements are examined in upcoming chapters, support for the requirements will therefore be looked for in the strategies. As an introduction to the strategies, the overall vision of I4 is presented:

‘To BECOME and REMAIN one of the world’s leading company in the Power Generation Industry!’

‘With our Global network of innovation we empower the industries of the world’

The following goal of procurement is formulated in the strategy document:

‘The goal of procurement is the development of competitive advantage through the implementation of long term, total cost reduction opportunities of mutual benefit to the supplier, Siemens and Siemens’ customers.’

Since the acquisition by Siemens, it has been very clear that the goal for I4 is substantial growth, in order to take market shares from, above all, market leader General Electric. In the strategy documents, it is stated how procurement can support the growth ambition. The following points can be read:

- Increase geographical penetration - local content
- Increase currency flexibility - source hedging
- Use Siemens’ global purchasing network
- Forge global strategic alliances with appropriate suppliers
• Promote multinational skills development

Through sourcing hedging, the currency flexibility can be increased. The aim is to use the most beneficial exchange rate, by having sourcing alternative in different currencies.

Local content is sometimes a demand from the end customers. Today, the supply base is very concentrated to Europe, as shown in the left chart in figure 2.6 below. In Lincoln they mainly have local suppliers. The goal in ten years is that equal shares of material and services will be sourced from Europe, America and Asia.

![Figure 2.6: Share of sourcing from different parts of the world in 2005 (left chart) and 2015 (right chart).](image)

**Future Scenarios**

Procurement is also affected by the market development and by the fact that the power generation is a mature industry. Some future scenarios that will affect I4 Procurement are brought up in the strategy document. These are outlined below and they involve both changes which are outside the control of Siemens and changes which are within control.

**General trends**

- Expansion of the European community
- Decline of manufacturing in Western Europe
- GBP and SEK outside the Euro zone
- The expanding global economy - increased competition
- Higher amplitude on currency swings

**Changing conditions for I4**

- The move from ‘component’ purchase towards ‘system’ purchase - a platform approach
- Our desire to partner with technology leaders
- Future marketing strategies may require sourcing from the countries where Siemens’ turbines are sold (local for local)
- Increased group wide collaboration will increase leverage and demand higher co-operation
- Exchange rate management - becomes even more critical
If GBP and SEK remain outside the Euro zone, it will be important for both Lincoln and Finspong to handle currency risks and to improve the skills within exchange rate management. The move towards system purchases suggests that I4 will outsource activities. In this context it should be mentioned that insourcing of core activities is something that occurs too. Very recently, I4 acquired Trestad Svets AB, which is a manufacturer of combustion chambers for turbines.

**Road Map**

Our task, as mentioned earlier, concerns competency requirements in 2010 and beyond. To be prepared for the future, the company has already made a ‘long term purchasing road map – 2010 and beyond’. In this road map the following targets, which are interesting for the upcoming analysis of the study, are mentioned:

- Price and cost development ≤ our main competitors
- Service level (all through the year) > 97 % and no delays to customer, caused by suppliers
- Quality assurance secured at suppliers leading to reduced NCC\(^{11}\) cost of 75 %
- Social responsibility – THE GOOD EXAMPLE
- Employee Satisfaction/be regarded as best place to work
- Supplier satisfaction – 80 % positive suppliers

The long term purchasing road map also states that to become world class in purchasing is one of the goals for I4 Procurement. To reach this goal, the following objectives have to be reached:

- Operate globally
- Mitigate risks in the supplier network
- Enforce e-business integration
- Supply chain management, i.e. towards managing 2\(^{nd}\) and 3\(^{rd}\) tier suppliers

To manage 2\(^{nd}\) and 3\(^{rd}\) tier suppliers within the supply chains of I4, enforced e-business integration is needed. Increased use of the Internet within all Siemens’ processes, including procurement, will make the company more efficient and competitive.

E-procurement tools have been used in Finspong since 2004 and the use of them is still very limited. Single sourcing is quite common and makes it impossible to use e-auction. Within ordering, a vendor scheduling system, which enables suppliers to forecast orders, is under progress. Besides, a web based platform called e-Net “I” is used to place orders electronically with SAP R/3, leading to reduced transaction costs. Mainly because of negative attitude towards new e-tools, only approximately one of every twenty five orders

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\(^{11}\) Non Conforming Costs. These costs arise as a result of inferior quality in products or processes.
goes electronically through e-Net “I” so far (December 2005). In Lincoln, approximately one of every eight order goes electronically through e-Net “I” (November 2005). The manager Methods/Controlling in Lincoln assumes that the reason why e-Net “I” is used more in Lincoln than in Finspong is that they had an electronic order system with many suppliers even before e-Net “I”; hence both suppliers and buyers are already used to it.

Another reason why the e-business integration is further developed in Lincoln is that the amount of locally situated suppliers is higher for I4 in Lincoln than in Finspong. To introduce changes is always easier when the partners are closely situated and when cultural differences do not exist. However, it will be a greater challenge for Lincoln to fulfil the objective of operating globally, since their present supply base is very concentrated to the U.K.

2.3.4 Ongoing Competency Project
A mapping of competency requirements and areas of responsibility for core functions started at I4 in the spring of 2005 and is still under progress. The purpose with the mapping is to create a catalogue containing job profiles for these functions. Having identified core functions, the company management knows which roles cannot be outsourced in the future and where it is critical to make priorities. It is a strategically very important question. The project is driven from the top management level of Siemens PG and the aim of the project is to make it a continuous updating process of job profiles. The difference compared to this Master’s thesis is that the ongoing competency project is based upon thoughts and opinions of the managers concerned, whereas the competency requirements stated in this theses are mainly based on external trends and the latest research within the area.
3 Theoretical Frame of Reference

In this chapter, the theoretical framework required for the assignment is presented. At first, the importance of purchasing as a business function is described. Then macroeconomic trends and challenges for purchasing are presented. This is followed by a discussion concerning competency development issues. Finally, the theories in the frame of reference are summarised in a synthesis.

3.1 The Importance of Purchasing

Purchasing is responsible for performing all activities involved in the acquisition of goods and/or services from external suppliers in the most effective and efficient way possible. The following main objectives show how the function can contribute to a company’s competitiveness:

- Cost optimisation (e.g. lower transaction costs and overhead costs)
- Asset utilisation (e.g. outsourcing and inventory management)
- Value creation (e.g. process/products development and quality improvement)

Further, van Weele describes means for purchasing to contribute to the company’s competitiveness. By assuring that superior suppliers which deliver the right components, in the right quality and at the right time are contracted, purchasing can facilitate production and assure the quality of the end product. This can also contribute to shorter and more secure delivery times of the end product. In addition, by reducing purchasing costs the function can contribute to substantial price reductions of the end product. The leverage effect of purchasing can be considerable depending on the purchasing-to-sales ratio and the capital turnover ratio.

Along with the trend that companies outsource more of their activities, their dependency on the competitiveness of their suppliers has increased. The increased outsourcing has made the cost share of purchased material in the price of many end products higher. Hence, purchasing decisions’ influence on the company’s financial result has enhanced. This is why management has become increasingly aware of the purchasing function.

The increased impact from purchasing on corporate performance is supported by a study recently conducted by IBM Business Consulting Services. In the study, called the Global CPO Survey, purchasing managers and other people in leading positions at companies around the world were interviewed concerning the current and future role of purchasing. Many reasons to the increased importance are pointed out, for example the growth in

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13 Axelsson et al (2005)
15 van Weele A.J. (2005:2)
outsourcing, corporate restructuring and increased supplier value adding and risk.\textsuperscript{16}

To give some background to the present focus on purchasing, a brief history of the development of the function will now be provided.

### 3.1.1 Historical Development

Historically, the position of purchasing within a company has been relatively weak. It has not been considered as a function that can contribute to the overall business performance in any dramatic way. It has simply been regarded as an operational function responsible for acquiring goods and services. This attitude towards purchasing has now changed. The traditional, clerical tasks have evolved into more strategic ones, making purchasing a key function within the organisation.\textsuperscript{17} One explanation to this development is that the value of purchased material nowadays, in average, makes up 60\% of the production value of industrial companies. This shows what a major influence purchasing has on the overall business performance.\textsuperscript{18}

It is obvious that the role of purchasing within the company has shifted widely over the years. Monczka et al assert that a few conclusions can be made concerning the era of 2000 and beyond. First, that the role of purchasing is presently being reshaped in order to fit the modern economy. This is related to the increasing globalisation, technology development and changing consumer demands. Another conclusion, according to Monczka et al, is that purchasing must continue its integration with customers, information systems, operations etc.\textsuperscript{19}

### 3.1.2 Purchasing Tasks\textsuperscript{20}

In this chapter, the different purchasing tasks and activities will be presented, based on van Weele’s purchasing process. This process describes the different purchasing activities in six steps, as shown in figure 3.1 below.

![Figure 3.1: The purchasing process.\textsuperscript{21}](image)

\textsuperscript{16} The Global CPO Survey (2005)  
\textsuperscript{17} Badenhorts-Weiss and Fourie (2004)  
\textsuperscript{18} van Weele A.J. (2005)  
\textsuperscript{19} Monczka et al (2002)  
\textsuperscript{20} van Weele A.J. (2005)  
\textsuperscript{21} Adapted from van Weele A.J. (2005), p.13
Step 1 – Defining Specification
To decide whether to make or buy a product or activity, a specification of those items that may be purchased is drawn up. If a functional specification is chosen, instead of a detailed technical specification, potential suppliers are given the best possible opportunity to contribute with their expertise. The purchase order specification includes aspects such as quality, maintenance and logistics specifications, legal requirements and a target budget. Purchasing is often involved in the specification phase to a minor extent, since the specification is determined by the user.

Step 2 – Selecting Supplier
The selection of supplier is often initiated already together with the first step, since the specification may have to be adapted to specific supplier conditions. There are a number of selection criteria that have to be taken into consideration, for example the supplier’s financial situation and ability to meet quality requirements. The process of selecting a supplier is therefore very important and complicated.

Step 3 – Contracting
The use of standard purchase contracts is limited because specific commercial and legal terms and conditions vary per company culture, market situation, product characteristics etc.\(^{22}\). When contracting an outsourcing agreement the contract is of particular importance, because it is the legal basis for a long-term and closer relationship. The contract has a great impact on the success of the joint operations and incentives and/or penalties are often used to give cause for the provider to work as a partner. Whether to use incentive and/or penalties must be agreed upon by both parties and additional aspects like scope of services and the importance of a co-operative relationship need to be covered.

Step 4 – Ordering
Ordering means that a purchase order is sent to the contracted supplier. For this, efficient ordering routines between the supplier and the buying company should be developed.

Step 5 – Expediting
Placed orders are to be expedited to ensure that delivery dates are met. This requires lots of attention and computer-supported methods for expediting should therefore be developed. There should also be sound procedures for carrying out trouble shooting when this is needed.

Step 6 – Follow-up and Evaluation
Evaluation of suppliers is carried out after the order has been delivered. This is important to keep track of the supplier’s quality, delivery service and capability. This information can facilitate future supplier selection.

\(^{22}\) van Weele A.J. (2005)
3.2 Macroeconomic Trends Affecting Procurement

Below, the influences of macroeconomic trends on procurement, in terms of competency requirements, are described. The trends concerning globalisation, outsourcing and information technology are the ones emphasised by Axelsson and van Weele during interviews. Additionally, these trends are also the ones frequently discussed in much of the literature by other authors. According to Axelsson, corporate social responsibility will also have an impact on procurement in the future, whereas van Weele thinks that changes in consumer patterns will be of greater weight.23,24

The importance of corporate social responsibility is brought up as a consequence of emerging regulations and pressure from stakeholders. As this is backed up by several authors, this trend has been addressed as well. Changing consumer patterns is, in addition to by van Weele, also emphasised by Christopher and will be discussed at the end of this chapter25.

Van Weele and Axelsson are two authors frequently used in the upcoming chapters. These are two acknowledged purchasing professors, having long experience within the purchasing area and having written several well-reputed books on the subject.

3.2.1 Globalisation

Since the last decades of the 20th century, the world trade has increased and there is a consensus in the area of research that the growth of globalisation will continue in the foreseeable future. Both expanding demand in new markets and the liberalisation of international trade have driven this trend. Furthermore information technology and improved transportation have influenced the possibilities for international trade26. As an effect of the liberalisation, newly emerging economies started building their own industries and now there is an over capacity in almost every industry, resulting in increased competition. Consequently companies constantly have to find new competitive advantages.27 Christopher forecasts that soon most markets will be dominated by global companies. A global company sources materials and components worldwide, manufactures offshore and sells in many different countries.28

According to a survey made by McKinsey in 2004, most executives from a wide range of industries and regions still feel positive about the global economy. Many of them also feel ongoing pressure on prices. This means that competition remains heated.29 This is in line with the results from the Global CPO Survey, conducted by IBM Business Consulting

23 Axelsson B. (2005-09-30)
25 Christopher M. (2005)
27 Christopher M. (1998)
28 Ibid.
Services. According to this study, most companies aim to increase their supply or production in emerging regions. Regions in question are primarily Eastern Europe and South East Asia, especially in India and China. This leads to implications such as global sourcing and offshoring. Companies already established in these regions experience lack of local support and problems with language and complex contracts.\(^\text{30}\)

According to Axelson, the globalisation will entail demands on new competencies for purchasers. Since procurement will need to have a more global view, purchasers must be able to act in an international field. This in turn means that language proficiency and intercultural communication will be required.\(^\text{31}\)

**Global Sourcing**

One important consequence of the globalisation of markets and competition is that supplier sourcing has become global. The opportunities for this have increased since the establishment of free-trade zones like EED (Europe), NAFTA (US, Canada, Mexico) and the ‘Yen block’ (Asian nations)\(^\text{32}\). Global sourcing can be defined as ‘the worldwide integration of engineering, operations, logistics, procurement, and even marketing within the upstream portion of a firm’s supply chain’.\(^\text{33}\) Since the main purpose of procurement is to develop a competitive, world class supply base for the company, their work must evolve when the entire world is viewed as a source of supply. For example, factors affected by the globalisation have to be addressed when assessing suppliers. Traditionally, purchasers have focused on price, delivery, quality and service when evaluating suppliers. But to evaluate foreign suppliers, additional variables like global culture versus national culture and global efficiency versus local responsiveness must be considered. In addition, there are more potential suppliers to evaluate in a global market, requiring appropriate techniques to handle larger amount of data. Iandoli et al believe that the globalisation will entail new challenges in the supplier selection procedure. These challenges will concern which criteria should be considered in order to evaluate the country risk and how to identify and evaluate criteria related to cultural aspects.\(^\text{34}\)

Monczka and Trent describe in more detail the competencies needed to carry out global sourcing efficiently, based on the views of global sourcing managers. Their study reveals the importance of cost analytical skills, understanding of worldwide supply markets and the ability to negotiate and develop global contracts. Strong communication and presentation skills, an understanding of strategy development and the ability to think holistically are other areas of key competencies that are brought up. The authors further consider lack of qualified personnel as a difficult barrier to overcome before global sourcing can be implemented. Suitable areas to recruit from are suggested to be other functions within or

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\(^{30}\) The Global CPO Survey (2005)

\(^{31}\) Axelson B. (2005-09-30)

\(^{32}\) van Weele A.J. (2005)


\(^{34}\) Iandoli et al (2003)
outside the company and the universities. To secure the access of competent staff for global sourcing, companies may have to build long-term relationships with top academic institutions.\footnote{Monczka R.M. and Trent R.J. (2003)}

**More Contacts with other Cultures**

As a result of global sourcing and outsourcing to foreign countries, companies do business with companies having different national cultures than themselves. This of course can cause problems. According to an empirical study of Snijders and Tazelaar, one reason to problems is that national culture or etiquette creates different perceptions of different groups of people. Moreover, the study showed that there are likely to be differences with regard to trust between nationalities.\footnote{Snijders C. and Tazelaar F. (2003)} The importance of trust in business relations is described further in chapter 3.3.3.

A business relation involves many negotiations. Apart from culture, different languages, customs and laws also make the negotiation more complex when negotiating with other nationalities. International negotiation therefore requires additional preparation and skills to be successful. Apart from traditional supplier analysis and fact finding, the purchaser must also understand the customs and traditions of their counterpart. A research focused on the characteristics of effective international negotiators revealed that the negotiator should have the following qualities.\footnote{Monczka et al (2002)}

- Patience
- An honest and polite attitude
- Knowledge of the contract agreement
- Familiarity with foreign cultures and customs

### 3.2.2 Outsourcing

The globalisation leads to severe competition among companies around the world, resulting in an increased role of outsourcing. To become more efficient, companies mainly focus on its core competencies and other activities are delegated to companies which conduct the activities more professionally. In this way, cost reduction, quality improvement and lead time reduction can be achieved. Outsourcing is therefore a particularly good solution for companies being in the stages of saturation, since they need to find ways to sell end products at very competitive prices.\footnote{van Weele A.J. (2005)}

According to the Global CPO Survey, the growth in outsourcing is expected to continue, and especially category outsourcing is brought up as a driver for value creation. Category outsourcing means outsourcing of a whole category of products. As for purchasing, one of the most suitable categories to outsource is said to be procurement technology. A
mentioned obstacle for category outsourcing is skill shortage within complex contracting management and supplier management.³⁹ The importance of contracting management has, according to Minahan from AberdeenGroup and Lustig from Procuri increased as a consequence of the globalisation and the increased number and complexity of contracts. If contracts are managed ineffectively discounts may be missed, maverick buying may increase and customers may not be satisfied.⁴⁰

Outsourcing results in global networks which demand trust between business partners and close relations. In these networks procurement is an important actor. Suppliers will have to be evaluated very carefully to ensure that they can perform excellent results and function in closer partnerships.⁴¹ To succeed in these partnerships, many aspects need to be taken into consideration. Some of these are described in chapter 3.3.3.

The opposite of outsourcing (or offshoring) is insourcing. This can be defined as the process of moving activities, previously performed by suppliers, indoors.⁴² This phenomenon is described by Friedlander, in the view of US companies. He states that many companies are discovering the drawbacks to outsourcing business activities to, for example, China and India. They experience problems such as disloyalty, defections and theft of ideas. The poor loyalty leads to much movement of employees on the market and to difficulties with recruiting and keeping skilled people. The movement of people also creates new competitors. Even with these risks in mind, outsourcing to low-wage countries remains a strong trend for companies chasing cost savings. However, risk assessment is important before outsourcing overseas.⁴³ Examples of risks to take into consideration are the stability of currency and legal system in the region in question, government and social stability etc.⁴⁴ Because of the outsourcing risks and the loss of control some authors instead advocate insourcing.⁴⁵

3.2.3 Information Technology

Many authors predict that the development of information technology will drastically change the work of procurement in the near future. Axelsson is convinced that information technology will become a more natural and integrated part of companies’ work in the years to come.⁴⁶ Advanced information systems have already had important consequences, not only on procurement but on the whole supply chain. As described in chapter 3.3.4, the trend towards managing the whole supply chain has been facilitated by information systems. The use of information technology is also expected to facilitate many of the tasks, giving time

³⁹ The Global CPO Survey (2005)
⁴¹ Schorr J. E. (1998)
⁴² Berggren et al (2005)
⁴³ Friedlander J. (2005)
⁴⁵ Heaton J. (2004)
⁴⁶ Axelsson B. (2005-09-30)
for focusing on negotiation and other strategic supplier issues.\textsuperscript{47} In the new economy, information is a key issue. Both the Internet and other databases give access to an enormous amount of data. Purchasers need to be able to find and extract the needed information from its source.\textsuperscript{48} Thus, data base management skills will be important in the future.\textsuperscript{49}

The development of IT has enabled companies to conduct businesses electronically, usually referred to as e-business. E-business can be defined as ‘the conducting of business on the Internet, not only buying and selling but also servicing customers and collaborating with business partners’.\textsuperscript{50}

\textbf{E-business}

The accessibility of the Internet has increased dramatically in recent years. Still, the impact of e-business has not yet been as extensive as expected, which may be related to implementation problems in the beginning. Even with these problems in mind, there is a general consensus that e-business in the future will be the predominant way for business transactions. When it comes to strategic purchasing, the Internet is mainly used as a mean for searching and sharing information.\textsuperscript{51} Monczka et al predicts the Internet to have an even greater impact on purchasing. The authors describe how the future platform for sourcing and integrated supply chain management will be Internet-based. They present the following list over the Internet’s impact on purchasing\textsuperscript{52}:

- Web-based intelligent agents will allow buyers to globally search for best price, delivery, and availability.
- Internet-based tools will provide the structure, the ability to measure progress and performance, the means to share information, and the rules to administer integrated supply chain management.
- The buying and selling of commodity and standard industrial goods through Internet auctioning will increase, creating risks and opportunities.
- Internet-exchanges will lead to huge consortia with members leveraging information and volumes across the entire supply chain.
- Sourcing from emerging markets will increase as expanded connectivity through Internet provides visibility to worldwide sources.

When it comes to e-procurement, an empirical study conducted by Croom suggests that a centralised procurement function is a precondition for making it profitable. The reason for this is that the implementation costs demand a certain economy of scale in order to be defendable.\textsuperscript{53} Having e-procurement systems integrated with the suppliers, operative

\begin{footnotes}
\textsuperscript{47} Gonzalez et al (2001)
\textsuperscript{48} Monczka et al (2002)
\textsuperscript{49} Axelsson et al (2005)
\textsuperscript{50} Powernet, www.powernet.co.uk/client/general/glossary.shtm, (2006-01-24)
\textsuperscript{51} Gadde L.E. and Håkansson H. (2001)
\textsuperscript{52} Monczka et al (2002)
\textsuperscript{53} Croom S.R. (2005)
\end{footnotes}
purchasers should be able to directly search for products in electronic catalogues. The products in the catalogues are authorised and negotiated by strategic purchasers in advance.\textsuperscript{54} Other authors, for example van Weele, suggest that e-procurement solutions are mainly preferred for routine products and indirect goods, and not for strategic products.\textsuperscript{55} This opinion is supported by Porter, who concludes that products and services with high demands on co-ordination with the supplier are no candidates for e-procurement solutions.\textsuperscript{56}

The impact of e-procurement was also addressed in the study conducted by IBM Business Service. It showed that these techniques were not widely adopted in the procurement organisations today, but the use of e-procurement is nonetheless slowly increasing in importance. The benefits are\textsuperscript{57}

- Reduction of transaction costs
- Improvement of spend control and transparency
- Reduction of maverick buying and increased contract compliance
- Reduction of administrative workload
- Reduced procurement cycle times through simpler or automated processes

\subsection*{3.2.4 Corporate Social Responsibility}

The fourth trend concerns corporate social responsibility (CSR). When referring to purchasing in particular, CSR is by some authors called purchasing social responsibility (PSR). CSR concerns areas such as the impact of the company on the natural environment, workplace safety and other conditions for employees and community involvement.\textsuperscript{58} Axelsson thinks that the trend towards a sustainable development will gain increased weight. This mainly because companies acting in countries with low prices are considered to compete unfairly, by poisoning the environment and not treating the staff justly. He further assumes that this will lead to rules and regulations for a more sustainable development.\textsuperscript{59} Axelsson’s view is in part supported by Idowu and Towler. They have studied CSR efforts among U.K companies and they conclude that a few organisations around the world should co-ordinate their efforts in putting together CSR standards, in order to avoid confusion and clarify what one should look for in a ‘normal’ CSR report.\textsuperscript{60}

In addition, Gardiner et al describes how the demands for greater CSR are driven by a number of stakeholders, including governments, customers, investors and different organisations. The background to this movement is the constantly increasing influence

\begin{thebibliography}{60}
\bibitem{54} Puschmann R. and Alt R. (2005)
\bibitem{55} van Weele A.J. (2005)
\bibitem{57} The Global CPO Survey (2005)
\bibitem{58} Carter C.A. (2005)
\bibitem{59} Axelsson B. (2005-09-30)
\bibitem{60} Idowu S.O. and Towler B.A. (2005)
\end{thebibliography}
which multinational enterprises have through their production, purchasing and investment decisions.¹６¹ Van Weele also recognises the importance of CSR, but in his opinion it is a vital issue mainly for consumer goods companies with a high brand image and reputation. CSR is relevant for other manufacturing companies as well, he continues, but since they have less visibility to the public, CSR usually gets less attention.₆²

**CSR and Purchasing**

The advocates of PSR emphasises its possibility to improve the company’s performance in many ways. Studies have shown that PSR activities improve organisational learning, which in turn leads to improved supplier performance and cost reductions. Other positive outcomes of CSR, mentioned by Idowu and Towler, are facilitated recruitment of talented personnel, avoidance of potential bad reputation which may occur from environmental incidents, more supportive communities and more loyal customers.₆³ The CSR activities prevent damaging the company brand.

The role of procurement within CSR may involve minimising usage of non-renewable materials and evaluation of the environmental and ethical standards of suppliers.₆⁴ Procurement also has the opportunity to introduce environmentally sound process technologies and environmental performance measurements to partners in the upstream supply chain.₆⁵ For purchasing managers, co-ordination with and management of suppliers to ensure the fulfilment of PSR goals are important.₆₆

As described above, the PSR philosophy suggests that companies should take ethical and environmental issues into consideration when selecting suppliers. This, however, does not get much attention from companies today. According to the Global CPO Survey, environmental issues and CSR are no key criteria.₆₇ This result is in part contrary to Axelsson’s reasoning. As mentioned, he expects CSR and sustainable development issues to affect procurement more in the future.₆₈

**3.2.5 Changing Consumer Patterns**

According to van Weele, customer demands and preferences are changing and markets have become customer driven instead of supplier driven.₆₉ This is a consequence of consumers becoming more well-informed and hence more aware of their purchasing power. The earlier mentioned trend towards increased availability of information technology has

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¹⁶⁴ Ibid.
¹⁶⁷ The Global CPO Survey (2005)
¹⁶⁸ Axelsson B. (2005-09-30)
facilitated the opportunities for consumers to make price comparisons. Consumers’ increased power is also the reason why these stakeholders can pressure companies to become more socially responsible, as argued in the preceding chapter.

Today, consumers are not only valuing products on the basis of quality and price. They also make heavy demands on service and time and they demand products and services to be designed for their unique and particular needs. This empowerment of consumers results in companies having to reduce costs and improve efficiency.

### 3.3 Challenges for Procurement

Today’s businesses are heavily exposed to changes and competition. As a result, the whole supply chain will have to collaborate to be able to deliver a competitive end product. This affects procurement, since this function is responsible for upstream relations. Changes in the surrounding world lead to necessary adaptations and transformations within organisations. Christopher emphasises that the rate of external changes should not be higher than the rate of changes in the internal environment.

To make business transformations successful it is important that the organisation has developed competencies that are appropriate to the changes. This coincides with the results of a study, commissioned by the Chartered Institute of Purchasing and Supply (CIPS), saying that purchasers have to be able to work in a constantly changing environment. Furthermore, as the traditional boundaries between functions are eliminated, the tasks and roles of people become less clearly defined. This requires a more flexible attitude within procurement.

A number of measures are suggested to respond to the new requirements. These include increased specialisation, moving from functions to processes, moving from transactions to relationships and moving towards managing the supply chain. Below, competencies required as a result of these changes are described. This is followed by a description of knowledge- and competency areas important for purchasers.

#### 3.3.1 Increased Specialisation

The structure of the organisation influences its effectiveness. There is a trend that many companies separate the strategic and operational work of purchasing to make purchasing professionals perform less day-to-day buying, and hence be able to concentrate on more strategic work. Monczka et al even predicts that purchasing as a functional group may...
disappear at some organisations. Separating tasks increases efficiency, which is a requirement because of the increased global competition and changing consumer patterns. The process of evaluating, selecting and managing suppliers will gradually more be handled by cross-functional sourcing teams. In these teams, personnel from different departments are co-operating, often with only one member having formal purchasing experience. Once a supplier is selected and an agreement is reached, others can take care of placing orders.78

As stated in chapter 3.2.3, e-procurement systems enable operative purchasers to order directly from an electronic catalogue. However, by issuing procurement cards to selected users, holders can obtain what they require directly from approved suppliers, without interference from procurement.79 The users in questions can be those in need of the material, e.g. staff within production. Below, new strategic responsibilities for procurement, in consequence of the separation of operative and strategic work, are shown80.

- Establish e-procurement systems
- Develop alliances, long-term agreements and well-managed relationships
- Internally outsource the responsibility for releasing and ordering to users
- Provide users with procurement cards and convenient ordering systems
- Empower users through internet-based systems

The separation of strategic and operational job responsibilities is backed up by Axelsson et al as well. They argue that purchasing professionals will have to concentrate on strategic work. However, Monczka et al and Axelsson et al are of different opinions concerning who will handle the operative work. Axelsson et al state that new positions will be created to manage the operational purchasing activities, whereas Monczka et al claim that users who are in need of products will have procurement cards and handle operational purchasing activities in addition to their regular job responsibilities.81

3.3.2 From Functions to Processes
Traditionally, businesses have organised around functions and each function has had clearly defined tasks. The use of resources has been focused, rather than the creation of outputs. However, the customers measure the output. In order to focus the effort of the organisation on serving the customers, the customer or the end product has to be visible for everyone. To achieve this, companies need to be horizontally oriented and organised around cross-functional buying teams. This is important to make the organisation able to respond quickly to the fast-changing needs of the market. Speed is the key.82

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78 Ibid.
79 Ibid.
80 Adapted from Monczka et al (2002), p. 969
81 Axelsson et al (2005)
82 Christopher M. (2005)
A flat horizontal structure with teams responsible for sourcing strategy development that are aligned with the business strategy is advocated by Axelsson et al too. Further, Iandoli et al state that there is a trend towards that collaboration develops into inter-organisational cross-boundary alliances. In addition to such an internal integration, Axelsson et al emphasise the importance of external integration where purchasing has joint development (for example supplier councils) or improvement teams with key suppliers. This requires cross-functional understanding and management. In addition, team work capabilities and planning skills will characterise successful supply chain managers.

By moving from functions to processes, organisations become more responsive. Axelsson et al propose further developments of future sourcing organisations to make them more responsive:

- A global procurement board or council that oversees global activities.
- A chief procurement officer who executes purchasing council decisions
- Small professional procurement staff, acting as internal consultants and/or process managers who oversee strategic and tactical responsibilities.
- Procurement experts will be increasingly co-located with their internal customers and/or strategic suppliers to achieve greater understanding of requirements, planning and integration opportunities.
- International purchasing offices will become an important part of the organisational structure as companies shift towards global sourcing.
- Supplier councils will increasingly become part of the purchasing and supply management organisation.

### 3.3.3 From Transactions to Relationships

A supplier partnership is typically associated with single-sourcing, high volumes and long-term commitments. This means, according to Schorr, advantages for the buying company in terms of higher supplier performance and better problem solving capabilities. The strategy facilitates communication, product development and synchronisation of schedules with the supplier. Furthermore, the author reports that many large companies drastically have reduced their purchasing costs by adopting a single-sourcing strategy. Closer relations are therefore recommended, instead of traditional arm’s length relationship, in many buying situations. Gadde and Håkansson emphasise that relationships with suppliers can increase the competitiveness of the company by making use of the suppliers’

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[89] Ibid.
resources and technology.  

**Relationships**

If the purchaser shall become more of a ‘relationship manager’, a modified set of skills will be required. According to Kolchin and Guinipero, a more collaborative approach to the suppliers requires skills within the three areas shown in figure 3.2 below.

<table>
<thead>
<tr>
<th>Business skills</th>
<th>Interpersonal skills</th>
<th>Technical skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Market analysis</td>
<td>• Risk management</td>
<td>• Product knowledge</td>
</tr>
<tr>
<td>• Negotiation skills</td>
<td>• Written and oral communication</td>
<td>• Cost analysis</td>
</tr>
<tr>
<td>• Management of internal and external relations</td>
<td>• Leadership</td>
<td>• Computer literacy</td>
</tr>
<tr>
<td>• Change management</td>
<td>• Persuasion</td>
<td>• Governmental legislation</td>
</tr>
<tr>
<td>• Sourcing development</td>
<td>• Problem solving</td>
<td>• Total quality management</td>
</tr>
<tr>
<td>• Skills within planning and organisation</td>
<td>• International and cultural awareness</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 3.2: Skills within these areas are important in the supplier relation.*

The importance of the business skills is underlined by a study commissioned by CIPS (Chartered Institute of Purchasing and Supply) too, which stated that business awareness, project management and networking skills will be important competencies as a result of the enhanced integration with other business functions.

An important aspect concerning developing closer supplier collaboration is the dependency risk, which is discussed further in chapter 3.3.4. It is also important to point out that close relationships are not appropriate for all kind of supplier relations. Van Weele suggests purchasing managers to develop different strategies for different supply markets, depending on the supply risk and on the purchasing’s impact on the bottom line to the company (see figure 3.3). Based on an adaptation of Kraljic’s purchasing product portfolio, he shows that partnership is the appropriate strategy for strategically important commodities.

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92 Gadde L.E. and Håkansson H. (2001)
93 Gonzalez et al (2001)
Communication

In a relation, communication is very important. This is included in figure 3.3 above and is further developed by Large and Gimenez. They have examined what qualities a purchaser should have to manage supplier relations properly, and a conclusion from the study is that frequent communication between the purchaser and the supplier seems to be a precondition of supplier management success. The study shows, among other things, that high oral communication skills is a valuable quality for the purchaser in the relation to the supplier. It enables the purchaser to find tactful words in the dialogue with the supplier, even in a tense or difficult situation. In addition, it is shown that the quality of the relation is positively influenced by developed communication skills. The quality of the relation was, in this study, measured in terms of understanding, trust and readiness to help and to co-operate. Also, oral communication capability affects the information quality in terms of accuracy, reliability, relevance and timeliness. This requires necessary level of oral communication capability and a positive attitude towards communication with suppliers. The oral skills can be improved through mentoring, coaching and training.98

Trust

Another important factor in a business relation is trust between the partners. This is argued by Snijders and Tazelaar. The more trust the more incompleteness is accepted in a contract. In case of trust a lean contract is therefore enough. A lot of written planning often goes

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97 van Weele (2005), p. 150
along with more problems during a transaction. Trust consequently results in decreased transaction costs, and hence it is important that purchasers inspire confidence to both suppliers and to internal customers.  

3.3.4 Managing the Supply Chain

Christopher defines supply chain management as:

‘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.’

Traditionally, relationships between suppliers and customers have been adversarial rather than co-operative. Companies have tried to increase their profit at the expense of their supply chain partners. However, only transferring costs between companies within the same supply chain does not make the offer to the end consumer more attractive, since the end price will not be reduced. Instead, all companies within a supply chain must strive towards the same goal and be linked together as shown in figure 3.4.

Figure 3.4: An integrated supply chain.

The trend goes towards seeking to make the supply chain as a whole more competitive. This requires integrated information systems, which enable different organisations in a supply chain to share information. This is the key to success in supply chain management. The fact that companies will need to develop a vision on supply chain management will, according to van Weele, mean that procurement will have to divest a lot of activities. Axelsson as well mentions that the scope of many of today’s tasks will be reduced as a result of better business arrangements and preparatory work. Operative tasks will be automated or solved within the frame of more long-term agreements. As a result of this, there will be relatively more strategic purchasers in relation to operative purchasers. This will affect top managers to a large extent, who will have to bring changes into current settings and positions, a task which will not be popular among co-workers. Van Weele further reports that superior management of change is a key competency to make top managers act on their vision about supply chain management, and that leadership and power of initiative is required by chief procurement officers.

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100 Christopher M. (1998)
101 Christopher M. (2005)
102 Adapted from Christopher M. (1998)
103 Christopher M. (2005)
104 Axelsson B. (2005-09-30)
Risks in Supply Chains

As a result of the earlier described trend towards globalisation and because of the general tendency towards supplier base reduction and more complex networks, the vulnerability of supply chains to disturbances or disruptions has increased\textsuperscript{106}. This reasoning is supported by Norrman, who states that the vulnerability of modern supply chains has increased because of the globalisation\textsuperscript{107}. Also, Monczka and Trent argue that doing business internationally leads to new risks. They say that these risks are a result of extended supply chains, longer material ordering lead times, relying on new and unfamiliar sources of supply and total costs that may far exceed unit costs. Furthermore, languages and business practices create complexity that may not be present with domestic sourcing and different currencies must be managed\textsuperscript{108}.

The trend towards augmented outsourcing has made supply chains longer and more complex. The more links there are, the greater the risk of failure.\textsuperscript{109} As a result of outsourcing, the contractor becomes more dependent on the provider. This dependency leads to risks which need to be balanced against the anticipated cost savings, when making outsourcing decisions. Van Weele suggests incentives and penalties for above average and below average performance to reduce the risk that the supplier deviates from the agreed scope of work to get paid for extra work\textsuperscript{110}.

As described in chapter 3.3.3, a single-sourcing strategy is advantageous in many buying situations and a reduced supplier base is a prerequisite to have the resources to build relationships with suppliers. However, when there is only one supplier responsible for the supply of a commodity, a failure at this source causes disruptions for the whole supply chain. Attention needs to be paid to this risk when choosing a single sourcing strategy\textsuperscript{111}. The trade-off between the positive outcomes and the decrease in flexibility has to be addressed before making any decision\textsuperscript{112}. This requires analytical skills and a system approach from the decision maker. The Global CPO Survey shows that supply risk and supply chain security are issues that are becoming more important in supplier selection\textsuperscript{113}.

Supply Chain Risk Management (SCRM)

SCRM means understanding and trying to avoid effects that disasters or minor business disruptions can have in a supply chain. The risks are dealt with by applying risk management process tools in collaboration with partners in the whole supply chain\textsuperscript{114}. It is

\textsuperscript{106} Christopher M. (2005)
\textsuperscript{107} Norrman A. (2005-09-28)
\textsuperscript{109} Christopher M. (2005)
\textsuperscript{110} van Weele A.J. (2005)
\textsuperscript{111} Christopher M. (2005)
\textsuperscript{112} Axelsson et al (2005)
\textsuperscript{113} The Global CPO Survey (2005)
\textsuperscript{114} Norrman A. and Jansson U. (2004)
not enough to manage and mitigate the risks of the own company, since other links’ risks may have enormous and unexpected consequences for the own company.\textsuperscript{115,116}

The stages of the risk management process can be presented as in figure 3.5 below. This figure is based on Ericsson’s SCRM approach, described by Norrman and Jansson.

\textit{Figure 3.5: The risk management process.}\textsuperscript{117}

The risk management process starts with identification of risks, both risks affecting the own company and potential sources of risks at every significant link along the supply chain. Risk sources are mapped and then analysed to understand their potential consequences. Probabilities for events can be used to get an idea of the final probability. After the risk analysis, it is important to assess and prioritise risks to be able to choose management actions appropriate to the situation. One method is to compare events by assessing their probabilities and consequences in a risk matrix.\textsuperscript{118}

Risk management involves implementation of actions to reduce the consequences or probability of occurrence of risks. Generally used strategies are to avoid, reduce, transfer or share the risk. To avoid is to eliminate the types of event that could generate the risk. To reduce the risk, either probability or consequence can be reduced. The consequence could for example be reduced by having an extra warehouse, multiple sources or having risk managers and emergency teams appointed. Probability could be reduced by improving risky operational processes, both internally and in co-operation with suppliers, and by improving related processes, for example supplier selection. Risk could also be transferred to supply chain partners by moving responsibility for inventory or by outsourcing activities. The last mentioned strategy is to share risks, both by contractual mechanisms and by improved collaboration.\textsuperscript{119} Risk sharing has been identified as a key factor for successful implementation of SCM and often involves sharing of reward as well. However, risk sharing might be problematic if the partners have different attitudes toward risk.\textsuperscript{120} To share risks with suppliers more analysis and negotiation is required before writing the contract. The following points are important to succeed with risk sharing contracts.\textsuperscript{121}

- Trust
- Give a fair part of the profit to the supplier

\textsuperscript{115} Christopher M. (2005)
\textsuperscript{116} Norrman A. (2005-09-28)
\textsuperscript{117} Adapted from Norrman A. and Jansson U. (2004), p. 439
\textsuperscript{118} Norrman A. and Jansson U. (2004)
\textsuperscript{119} Ibid.
\textsuperscript{120} Agrell P.J. and Norrman A. (2004)
\textsuperscript{121} Norrman A. (2005-09-28)
• To share information and to be clear
• Create cost models about what is happening in the SC

Christopher suggests the SCRM process to be handled by a permanent cross-functional supply chain continuity team. Within this team, all skills necessary to undertake analysis and implementation involved in the SCRM process should be accessible. To ensure that high priority is given to SCRM the team should ideally report to the Supply Chain Director, if this person is on the board.\textsuperscript{122} To point out the signification of SCRM for procurement, the following quote by van Weele concludes this chapter.

\textit{‘Risk management will develop into one of purchasing’s key concerns. Purchasing managers need to identify those risks that may put the continuity and competitiveness of strategic sources of supply in danger and should be able to manage or mitigate these risks.’}\textsuperscript{123}

### 3.3.5 From Operational to Strategic

The development of purchasing from an operational to a strategic function has made decision making more knowledge and competency driven\textsuperscript{124}. For many purchasing organisations, it will be a great challenge to raise the competency level. A suitable approach may be a categorisation of knowledge and competency areas, especially within companies that have a sophisticated purchasing strategy or a complex purchasing organisation\textsuperscript{125}. A recent study involving Dutch firms has identified six purchasing knowledge domains that should be developed within companies\textsuperscript{126}. The knowledge domains are presented below, and are in more detail described by Axelsson et al.\textsuperscript{127}

**Organisational knowledge**

This is knowledge about the organisation’s objectives, values and strategies. It enables the purchasers to take the right decisions in the broader organisational picture.

**Professional knowledge**

This includes, for example, negotiation skills as well as knowledge of concepts, tools and theories needed to reach business objectives.

**Supply market knowledge**

Knowledge about the company’s supply markets is crucial for many reasons. Cost modelling, negotiation, sourcing alternatives and strategic planning are a few of the reasons brought up by the authors.

\textsuperscript{122} Christopher M. (2005)
\textsuperscript{123} van Weele A. J. (2005-10-18)
\textsuperscript{124} Axelsson et al (2005)
\textsuperscript{125} Ibid.
\textsuperscript{127} Axelsson et al (2005)
Supplier knowledge
This includes knowledge about both the supplier’s organisation and about the relation with the supplier. For ‘partner’ suppliers it is also important to know about their ability to improve and develop (R&D).

Customer knowledge
This is equally important whether the customer is internal or external. Their wants, needs and expectations must be known by the buyer to be able to satisfy the customer.

Product knowledge
The purchaser must primarily have knowledge about the products bought. Knowledge about the end product is needed if there is an interaction between purchasing and the customer, for example if participating in cross-functional project teams.

According to Axelsson, the new, more strategic, role of purchasing has lead to new competency requirements and in the future higher education will be required of personnel within purchasing. However young, well educated, people have already started to search themselves to purchasing, which was not the case ten years ago. The new purchasers should have good business understanding and be educated in economics, negotiation and law.\textsuperscript{128} Although knowledge is important, the ability to accumulate human capital (i.e. the ability to learn new things and develop skills) is even more critical on markets where organisations, products and technologies are changing rapidly. Therefore, networking, job rotation and continuous training and education will become valuable assets for buyers in the future.\textsuperscript{129} Some additional enablers of purchasing professionalism are stated by van Weele. In his opinion, the most important human skills are power of initiative and creativity, technical, business orientation and supply chain orientation\textsuperscript{130}.

It is further reported by Axelsson that what will be required by managers within procurement in the future is general management. In the future everyone will have understood the importance of procurement and hence managers will not have to market it anymore. Their tasks will mainly be to run innovative and development projects and to create superior opportunities for the personnel to perform qualified work.\textsuperscript{131}

\section*{3.4 Competency Development}
In this frame of reference, trends that will have an impact on procurement have been investigated in order to find out what competencies will be required in the future. To make the identification of future requirements meaningful, a general description of how the

\textsuperscript{128} Axelsson B. In: Silf Supply, (#2 2005), p. 5  
\textsuperscript{129} Axelsson et al (2005)  
\textsuperscript{130} van Weele A.J. (2005-10-18)  
\textsuperscript{131} Axelsson B. (2005-09-30)
function profiles within procurement should evolve in order to live up to the new requirements will now follow. As described in chapter 2.3, each function profile involves staff with the same kind of responsibilities. When formulating the purpose of this thesis, it was stated that a role consists of tasks, responsibilities and a certain set of competencies\textsuperscript{132}. Hence, depending on the tasks and responsibilities, each function profile can be connected to one or several roles and certain competencies are needed to fulfil each role.

We start off by defining the concept \textit{competency development}. According to Axelsson, it means taking measures in order to enhance the competency in a certain area for a co-worker, a group or a company.\textsuperscript{133} To achieve changes among people within an organisation, it is important to start out from the people affected; their abilities, knowledge, desires and ambitions. They must be allowed to participate and feel that their needs and conditions are taken into consideration. It is always hard to carry out changes if the co-workers experience that they have been kept outside and all changes come from top management level. Changes must be presented as a stimulating challenge, not as a threat. The development process is facilitated by encouraging the affected people to discuss the issues.\textsuperscript{134} It is also important to have an expressed philosophy and a strategy. The philosophy should express the goals of the change, whereas the strategy contains the means for reaching the goal.\textsuperscript{135}

The competency requirements of a company can, according to Axelsson, be entailed from the internal and external factors of the company in question.\textsuperscript{136} This is illustrated in figure 3.6 below.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig3_6.png}
\caption{The internal and external factors affecting the competency requirements.}
\end{figure}

Axelsson defines two ways to achieve individual learning in companies; educations and on-the-job-training. Educations are often performed outside the company, on a seat of learning. This kind of learning may in some cases lead to transfer problems, i.e. problems with translating the acquired knowledge to the actual working situation. Such problems are usually avoided when choosing on-the-job-training. Learning is then, for example,
achieved through gradually modified and more complex tasks or by visiting other internal departments for practice.\textsuperscript{137}

The will of learning is a prerequisite when it comes to competency development of individuals. Only through motivation can this will be activated, thus is the job of creating motivation among the co-workers a major task when it comes to competency development within a company. Every person’s fundamental motivation is the search and establishment of her own identity, to develop ‘a self’. This is what enables us to have meaningful relations with other people.\textsuperscript{138} One way to acquire new competencies without learning and development of the existing staff is through recruitment.\textsuperscript{139}

\section*{3.5 Synthesis}

A synthesis of the theories brought up in this frame of reference is illustrated in figure 3.7 below. First, macroeconomic trends that will have a significant impact on procurement in the future were studied (chapter 3.2). The trends that have been addressed are globalisation, outsourcing, information technology, corporate social responsibility and changing consumer patterns. Further, challenges as a consequence of these trends were identified in chapter 3.3. These challenges included the move towards increased specialisation, from functions to processes, from transactions to relationships, from operational to strategic, and also the importance of managing the supply chain. Both in chapters 3.2 and 3.3, specific competency requirements emanated from the impact of macroeconomic trends and other challenges were addressed, and in chapter 3.4 the concepts role and function profile were introduced. In the synthesis, competencies, roles and function profiles are connected to symbolise that function profiles assume different roles and to fulfill each role a certain competencies are required.

\textsuperscript{137} Axelsson B. (1996)
\textsuperscript{138} Ibid.
\textsuperscript{139} Ibid.
Figure 3.7: The synthesis describes the relation between the different sections in the frame of reference. The function profiles assume different roles, and to fulfill each role, certain competencies are required.
4 Specification of Problem

This chapter begins with the definition of the overall and the studied system. Thereafter the purpose is decomposed into research questions.

4.1 System Definition

The system of this study consists of I4 Procurement, involving all function profiles within the purchasing organisation (IBP) and within the supply management organisation (IBS) in Finspong and Lincoln. The arrows in figure 4.1 symbolise the impact of the trends on I4 Procurement and all together this makes up the overall system of the study.

![Figure 4.1: The overall system, illustrating the impact of trends on I4 Procurement.](image)

Because of the complexity of the products bought by I4 Procurement, other functions are involved in some parts of the purchasing process. The technical specification, for example, is drawn up by the design function. This study concerns profiles within I4 Procurement only, and the following delimitation is therefore formulated:

- Requirements on function profiles involved in the purchasing process, but not part of I4 Procurement, will not be addressed in this thesis.

This delimitation will not affect future competency requirements on personnel within I4 Procurement.
The procurement function in the centre of the overall system consists of the different function profiles shown in figure 2.5. In dialogue with the sponsor of this thesis, it was decided that some of the profiles should be excluded in the study. The profiles in question are those held by one person only, since the result should not demonstrate competency gaps on an individual level. The excluded profiles include directors, managers within Controlling and Engineering, as well as procurement engineers and expediters. Hence, the following delimitation is formulated:

- Directors, managers within Controlling and Engineering as well as procurement engineers and expediters will not be studied in this thesis.

In the Procurement Controlling group, the senior profiles have been excluded since these exist neither in Finspong nor in Lincoln. The consultant and controller profile have been combined to just consultant, since these profiles have the same responsibilities. The revised procurement function is shown in figure 4.2 and makes up the specific studied system. The function profiles that have been excluded are shown with dashed lines.

![Figure 4.2: The studied system. Function profiles with dashed lines are excluded in the study.](image)

140 Adapted from internal document.
4.2 Definition of Research Questions

To be able to realise the purpose, it will be decomposed into concrete research questions. At first, the purpose is repeated with bolded keywords.

The purpose of this thesis is to analyse long term future requirements on function profiles within procurement at Siemens PGI4, in terms of competencies needed for crucial roles. The future requirements will be based on ongoing macroeconomic trends and the specific conditions for Siemens PGI4.

Related to the bolded keywords above, three research areas are identified. These areas will make out the basis for the remainder of this thesis, and also form the basis for the research questions. The way the research areas are interconnected to each other is described in the synthesis in chapter 3.5. Figure 4.3 below symbolises the interconnection; function profiles within I4 Procurement assume different roles when performing different tasks. In order to fulfil each role, a certain number of competencies are required.

![Figure 4.3: The final part of the synthesis from chapter 3.5; function profiles within I4 Procurement assume different roles when performing different tasks. In order to fulfil each role, a certain number of competencies are required](image)

Below, research questions to each of the research areas, as well as questions emanated from the frame of reference, are formulated in order to fulfil the purpose and the directives.

4.2.1 Roles

To find out what roles will be crucial within procurement beyond 2010, the different roles that need to be undertaken throughout the purchasing process need to be identified. Van Weele’s purchasing process is taken as a starting point and during the identification of crucial roles the specific competencies required by each role will be determined. This leads to the following research questions:

1. What roles within procurement will be crucial in the future?
2. What competencies are required to fulfil each role?

The answers to these research questions will, as stated in the purpose, be based on ongoing macroeconomic trends and the specific conditions for I4. The impact of trends were studied in the frame of reference, whereas the specific conditions for I4 were identified through
interviews with personnel at I4 as well as at other departments affected by I4 Procurement.

### 4.2.2 Function Profiles

According to directive II in chapter 1.3, a gap analysis shall be performed to compare the current competency level with the required future competency level. After concluding what roles and competencies will be important in the future, we need to connect them to the existing function profiles within I4 Procurement. This requires a mapping of those working at I4 Procurement today. It is probable that all of these employees will not work within I4 Procurement when the future requirements must have been reached. It is also possible that the division of responsibilities has changed at that time, and hence additional or other function profiles will exist. However, to enable us to do a gap analysis, we have no choice but to take the current function profiles as a starting point. The following research question is formulated:

3. Which future important roles will be required by each function profile within I4 Procurement?

To answer this question, a mapping of the tasks and responsibilities of each function profile is required; hence the following research question is formulated:

4. What will be the tasks and responsibilities of each function profile within I4 Procurement beyond 2010?

When studying the impact of macroeconomic trends on procurement, it appeared that the vulnerability of supply chains increases as a result of globalisation, outsourcing and supplier base reduction\(^ {141,142} \). I4, being an actor on the global market, is highly affected by these trends. To secure supply, I4 Procurement therefore needs to manage risks throughout the whole supply chain. The following research question is formulated in order to judge if the way the function profiles manage risks today will be sufficient beyond 2010.

5. How is supply chain risk management handled within I4 Procurement?

### 4.2.3 Competencies

To fulfil the gap analysis directive (directive II), the current level of competency as well as the desired target level for each competency and for each function profile has to be determined. The following research questions are formulated:

6. What is the current competency level for each function profile?
7. What is the desired target level for each competency and each profile?

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\(^{141}\) Christopher M. (2005)

\(^{142}\) Ibid.
Part of directive II was to compare the competency gaps between I4 Procurement in Finspong and Lincoln. This leads to the following research questions:

8. What are the differences between current competency level of function profiles in Finspong and in Lincoln?
9. What are the differences between Finspong and Lincoln, regarding the average competency level for all profiles possessing each role?

When the competency gaps have been identified, it is natural to give some recommendations regarding what competencies and roles need to be developed and how the desired level of these competencies can be achieved. General guidelines concerning competency development were discussed in the frame of reference. We formulate the following research questions:

10. What competencies need to be developed?
11. How can I4 Procurement obtain the future required competencies?

4.3 Summary of Research Questions
All identified research questions are summarised below.

1. What roles within procurement will be crucial in the future?
2. What competencies are required to fulfil each role?
3. Which future important roles will be required by each function profile within I4 Procurement?
4. What will be the tasks and responsibilities of each function profile within I4 Procurement beyond 2010?
5. How is supply chain risk management handled within I4 Procurement?
6. What is the current competency level for each function profile?
7. What is the desired target level for each competency and each profile?
8. What are the differences between current competency level of function profiles in Finspong and in Lincoln?
9. What are the differences between Finspong and Lincoln, regarding the average competency level for all profiles possessing each role?
10. What competencies need to be developed?
11. How can I4 Procurement obtain the future required competencies?
5 Methodology

In this chapter, the methods used in each phase of the study are described. A discussion about method problems and sources of error concludes the chapter.

5.1 Method for the Thesis

The work of this thesis has been divided into three separate phases; a planning phase, a research phase and an analysis phase. A division into different phases provides a good structure to work after and it shows what milestones have to be reached. This methodology is shown in figure 5.1, where some of the parts included in the different phases are shown.

Figure 5.1: Illustration of the method of this thesis.
5.2 Dimensions of the Study

Based on four different dimensions, Lekvall and Wahlbin describe a way to categorise scientific studies. These dimensions deal with the following choices:

- a case study or an overall study
- use of qualitative or quantitative data
- a time series analysis or a fixed point in time
- use of primary or secondary data

Below, this study is categorised according to the dimensions described by Lekvall and Wahlbin.

The study of I4 in Lincoln and Finspong is an example of a case study. We have made an in-depth study of the activities and preconditions for the two assembly works, in order to decide upon the current level of competency for different roles. This is the first dimension, referring to whether the study is conducted on an overall, general level, or as an in-depth study (also called case study). However, the first part of our study, when we examined what would be the future competency requirement on purchasing, was a survey study, which is an example of a broader, general study.

The data we obtained from competency questionnaires were quantified and mathematically analysed in a gap analysis. So, according to the second dimension, our study is based on quantitative rather than qualitative data and methods for analysis. The discussion about competency development, however, was conducted on a more qualitative level.

This study concerns required competency development. The results are presented in a star diagram where we only consider two points in time; today and beyond 2010. We have thus not studied patterns in the development over time and the study can therefore not be defined as a time series analysis. This is the third dimension, referring to whether the study concerns the conditions at a fixed point in time, or if it concerns a development over time.

The fourth dimension refers to whether the research is based upon primary data or secondary data. We have used primary data, collected from its source via questionnaires and personal interviews, in our analysis. However, for some parts of the report, mainly in chapter 2, secondary data have been used. This has for example been information from internal documents and from I4 web pages.

5.3 Used Methods

We used different methods to collect data. These are described in this section.

143 Lekvall P. and Wahlbin C. (2001)
5.3.1 Questionnaire
A questionnaire is a suitable method for collecting data from large populations to a low cost. Weaknesses with this method are low frequency of reply, lacking control over the interview situation and misinterpretations. When constructing a questionnaire, it is of great importance to make sure that the respondents will perceive the questions in the way intended. Thus, constructing the form and the question is a delicate task. It should be easy to respond to the questions and misunderstandings should not be possible. It is also recommended that the questionnaire is tested on a group of outside people, such as colleagues or friends.

We chose to use this method for the mapping of current competency level (see chapter 5.5.3). Primary data were needed in order to make a gap analysis. Making interviews with everyone would have taken a long time and it would have been difficult to find time for separate appointments with all of them. In the questionnaires, the personnel were asked to assess their competency themselves. This was done anonymously, as directive IV states that the result of this study shall not demonstrate competency gaps on an individual level.

When constructing the questionnaires, we followed the earlier mentioned guidelines. The questionnaires were sent out and collected via e-mail. This method of distribution was easy, fast and reliable, because all the personnel affected have a Siemens e-mail address. The percentage of answers was quite high. Appendix 2 shows the number of answers and the percentage for each function profile included in our study. Along with each questionnaire, a short letter which explained the purpose of the study was attached. In this letter we also clarified that the responses would be used anonymously in our thesis and we emphasised the importance of their participation in the study. One example of such a cover letter, the one sent to senior buyers, is shown in appendix 3.

5.3.2 Interviews
This method was used in all phases of the study. When planning the different interviews, we had to decide upon the degree of standardisation and structuring. In a completely standardised interview, identical questions are posed in the same order to every interviewee. The degree of structuring describes whether the questions have fixed replying options (e.g. ‘yes or no’) or if open, describing replies are asked for. All interview sources within Siemens are presented in appendix 4.

Besides the interviews described below, we also interviewed Jonas Waernborg at Silf Competence AB. Their business is to educate other companies in for example purchasing, and Waernborg is responsible for these purchasing educations. This interview gave us some general guidelines concerning competency mapping and future development of the

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144 Ibid.
Background Interviews
The structure of the background interviews can best be described as informant interviews\textsuperscript{147}. Different questions were posed to different people, depending on their position in the company. A few examples of the posed questions can be seen in appendix 5. Those shown are only the main questions, all interviews lead to different additional questions.

Interviews with Professors
We kept the interviews with professors at a low level of structuring, meaning that the questions were very open. The degree of standardisation was at a medium level, the main questions were the same, but the interviewee’s responses led to different attendant questions. The main questions can be seen in appendix 6.

Interviews with Managers
For purchasing managers, the structuring of the interviews was kept at a low level, in order to avoid directing the answers in any way. For managers at other departments, a low degree of standardisation as well as structuring was used. This should make the interviewee feel comfortable and talk freely about his/her opinions about I4 Procurement. The interviewees were asked if their responses could be used un-anonymously in the thesis. This was to be able to refer to their unique opinions and to bring out the differences between their views. This request was accepted by all managers.

5.3.3 Study of Literature
The study of literature makes up the basis of the frame of reference. Books and articles were read and in databases and on the Internet literature about ongoing trends and changes within procurement were searched for. Many of the trends described reflect the personal views of authors and purchasing professionals. In order to keep an objective approach we tried to focus on the trends which recur on many places.

5.4 Planning Phase
This phase stretched from the first day at Siemens until the completion of the planning report, including the first five chapters. To gain understanding of the present situation at I4, and particularly for procurement, we mainly focused on getting to know the company in the beginning of this phase. This included attendance at a number of presentations held by the purchasing managers and the purchasing director at I4 in Finspong. This phase also included background interviews and study of literature.

5.4.1 Background to the Study
Several background interviews were performed with people assigned the different function

\textsuperscript{147} Esaiasson et al (2004)
profiles within I4 Procurement. This gave an understanding of the present situation which was important during the later investigation of future work areas and tasks for procurement. Altogether, the background interviews gave a good insight into how procurement works at I4 and also how it has developed over the years. Based on data from these presentations, internal Siemens documents and the background interviews, the two first chapters were produced.

5.4.2 Future Competency Requirements

After getting a good hold on the problem, we started to search for information on the subject and to write the frame of reference. We soon discovered, however, that there was a limited amount of relevant literature about the future of purchasing. Many of the predictions of future purchasing directions were several years old or specified for certain lines of business. To complete the study of literature, interviews with purchasing professors were also carried out to capture the latest research. We performed interviews with two acknowledged purchasing professors, Björn Axelsson at Stockholm School of Economics and Arjan van Weele, at Eindhoven University of Technology. Both have long experience within the purchasing area and have written several well-reputed books on the subject. The main questions concerned their views on trends affecting purchasing, how purchasing functions will change in the years to come and what competencies will be required by purchasing staff in the future. The main questions can be seen in appendix 6.

To complete the literature study and the interviews with professors, some internal research was done to find out which competencies will be required by I4 Procurement in the future. The internal research was based on interviews with managers for the different units within procurement. The questions mainly concerned their views on future competency requirements on their staff. Their opinions were taken into consideration when the impact of trends was connected to the conditions of I4 in chapter 6.3. Asking managers what competencies they think will be required in the future is a method used by Ericsson as well148.

Besides managers within procurement, we also interviewed managers for other departments affected by the performance of I4 Procurement. This provided us with an outside opinion. The departments in question were Service (I1), Oil & Gas (I6) and production, both in Lincoln and in Finspong. I4 Procurement provides Service and Oil & Gas with supply of material and production is affected in the sense of manufacturing disturbance if the material is not delivered on time, or if the quality is poor. The questions posed to managers at these departments concerned their opinion in general about I4 Procurement, its status, frequent complaints, conflicts and problems, if they experienced any lack of competency and what they think I4 Procurement needs to improve. Information from these interviews is found in chapter 2 and in chapter 6 where the specific conditions for I4 are discussed.

From the information collected, roles which in the future will be crucial throughout the purchasing process were identified. Primary roles were identified, based on the different steps in van Weele’s purchasing process, as well as support roles. The latter are roles that will be important throughout the entire process. During the identification of different roles, it was also defined which competencies are included in each role. All roles and competencies are found in chapter 6.3 and answer the following questions, formulated in chapter 4.2.1:

1. What roles within procurement will be crucial in the future?
2. What competencies are required to fulfil each role?

5.5 Research Phase
This phase started at the completion of the planning report and involves collection of empirical data at I4 in Finspong and Lincoln.

5.5.1 Function profiles within I4 Procurement
The tasks and responsibilities of each studied function profile were mapped in the beginning of chapter 7. This was done in order to determine which roles and competencies will be required by each function profile in the future. The descriptions of the profiles are based on existing Siemens job profiles, interviews with people assigned that profile and questionnaire answers. To make the right connections, the mapping of studied function profiles’ tasks must be relevant beyond 2010 too. Therefore, likely future organisational changes which affect the tasks and responsibilities of studied function profiles were discussed with the production manager and the purchasing managers in Finspong, as well as with the manager Methods/Controlling in both Finspong and Lincoln. These assumptions are reported on in chapter 6.2 and all together the mapping answers the following research question:

4. What will be the tasks and responsibilities of each function profile within I4 Procurement beyond 2010?

5.5.2 Connecting Roles to Function Profiles
From the descriptions of current function profiles within I4 Procurement and of future required roles, it was determined which roles will be required by each function profile. This connection was made in chapter 7.2 and answers the following research question:

3. Which future important roles will be required by each function profile within I4 Procurement?

When function profiles were connected to the risk manager role, the following research question, which is associated to this role, was answered as well:
5. How is supply chain risk management handled within I4 Procurement?

This question was answered through interviews with purchasing managers in Finspong and Lincoln.

5.5.3 Mapping of Current Competency

One of the directives from the sponsor of this thesis was that a gap analysis should be performed. To fulfil this directive, the current level of competency within the future important areas had to be mapped.

When planning this mapping, a starting point was taken in the steps which Silf Competency AB goes through before they map competencies for their clients. Their business is to educate companies within purchasing, logistics and business negotiations. They always start with an analysis of the goals and strategies, present situation and vision of their client. There is a difference in this study compared with Silf’s way of working, since this study is not solely based on the vision of the client.

When Silf Competency AB maps their clients’ competencies, they use one of two methods; either a consultative competency mapping, or a mapping based on interviews. Since our study should involve an anonymous competency mapping, the first mentioned method was most suitable. When using this method, the personnel are estimating their competency level themselves and the estimation is then judged by their closest manager. Since the competency mapping in this study was not made on an individual level, but on an aggregated level for each function profile, the result was not verified with the closest manager. However, we asked managers at other departments if they experience any lack of competency among the staff within I4 Procurement. We also talked to a few Swedish suppliers to get their views on the competency level. The general comments from this external research were kept in mind during the upcoming analysis and formulation of recommendations.

The mapping of current competency is accounted for in chapter 8.1 and answers to the following research question:

6. What is the current competency level for each function profile?

Compiling the Questionnaire

As mentioned earlier, a questionnaire was used for the mapping of current competency levels. For each of the roles identified in chapter 6.3, certain competencies and qualities are required. These requirements were reformulated into questions and put into questionnaires for the different function profiles, considering the connection of roles and profiles (see chapter 5.5.2). Some of the competencies were further broken down to be easier to
understand. Similar questions were grouped under the same headlines; these headlines are presented in the star diagrams in chapter 8.2. When the questions were grouped, both similarity and target levels were considered. By grouping competencies, the graphical illustration of competency gaps was facilitated. The specific competencies included within each role can be seen in chapter 6.3, and all questionnaire questions for all function profiles are found in appendix 7.

One comment concerning the questionnaires should be made. Although buyers at Packaging were connected to all the same roles as senior buyers, they were issued a slightly different questionnaire. The reason to this was that their forms were sent out when the ones from senior buyers had been collected already, and we then came up with new, more distinct, formulations for a few questions.

5.6 Analysis Phase
In the analysis phase, the result from the competency mapping was compared with future competency requirements. Based on data collected in the planning phase and in the research phase, we analysed what competencies need to be developed by different function profiles in Finspong and Lincoln.

5.6.1 Gap Analysis
The collected data from the competency mapping were used as input to a gap analysis. The purpose of a gap analysis is to compare a current situation with a desired situation. The ‘gap’ is then often graphically illustrated in a star diagram and this how the competency gaps are presented in this study. An example of such a star diagram is shown in figure 5.2 below.

![Figure 5.2: Example of a star diagram for competency development.](image)

In star diagrams, the current level of competency, for the different function profiles, was
compared with the desired level in 2010. The current level was a mean value for the profile, put together from the questionnaire results.

To sum up the results from the gap analysis, a star diagram containing all the roles identified in chapter 6.3, divided on Finspong and Lincoln, was constructed. There is no target level indicated for the roles, since the target levels were set for specific function profiles, whereas this star diagram shows the competency level within the different roles aggregated for all profiles. The diagram was constructed based on the individual mean values from the different profiles; we did not calculate a new mean value for all profiles. Thus, the diagram is not completely accurate but still fulfils its purpose of summing up the analysis and showing differences between Finspong and Lincoln. Altogether, the gap analysis in chapter 8 answers the following research questions:

8. What are the differences between current competency level of function profiles in Finspong and in Lincoln?

9. What are the differences between Finspong and Lincoln, regarding the average competency level for all profiles possessing each role?

Determining Desired Competency Level
To be able to perform the gap analysis, the desired target levels for the different competencies had to be determined. In order to do this, different approaches were used. The levels available were the ones used in the questionnaires; Basic, Intermediate, Advanced and Expert (shown as 1-4 in the star diagrams). The frame of reference gave a preliminary indication of the importance of different competencies. The more strategic the role is, the higher should the target level be for most of the competencies. For the different function profiles involved in purchases, i.e. buyer, senior buyer and key commodity manager, van Weele’s adaption of Kraljic’s product portfolio was also taken into consideration, describing four different groups of products; leverage-, strategic-, routine- and bottleneck products. Depending on what kind of products different buyers are responsible for, different level of competency will be required. Other indications concerning desired levels were given during interviews with people from other departments.

Finally, and most importantly, the desired competency levels were evaluated by the managers for each function profile. They were asked to fill in the same questionnaires as the staff in their departments, but instead of assessing their own competencies, they stated what level of competency they think will be required beyond 2010. For all profiles except key commodity managers, there were two manager’s opinions to take into consideration (one in Finspong and one in Lincoln). The mean value was calculated and, based on the inputs described above, it was decided whether the desired level should be rounded up or down. This concluded in the target levels used in the analysis in chapter 8.2. The used target levels are indicated in appendix 7, where all questionnaire questions are presented.

mean values for the target of every competency, based on the views of managers, can also be seen in this appendix. For some of the function profiles, there are no mean values; for key commodity managers, no answer was received from their manager and for buyers at Packaging the target levels were based on those for senior buyers at Packaging. For buyers at Core Engine, the target levels were decided without involving their manager. This because their tasks and responsibilities will be so different beyond 2010 that it would be hard for their manager to estimate what competency levels will be needed.

When determining upon the target levels, the following research questions was answered:

7. What is the desired target level for each competency and each profile?

5.6.2 Suggestions for Competency Development
Based on the star diagrams, competency gaps were identified and the consequences of the gaps were discussed in order to decide what competencies need to be developed primarily. These recommendations are given in chapter 9.1 and answer the following research question:

10. What competencies need to be developed?

In addition, some general suggestions were given about how to achieve the desired competency levels. These suggestions were given for the procurement function as a whole, and are found in chapter 9.2. This answers the following research question:

11. How can I4 Procurement obtain the future required competencies?

5.7 Sources of Errors
According to Esaiasson et al, sources of errors can be described with respect to validity and reliability. Validity is a central problem in any scientific research. It concerns the question of whether we examine what we say that we examine or not. The validity issue occurs as a result of the translation between the theoretical problem formulation and the empirical research and is therefore inevitable. High validity means elimination of systematic errors. If we in addition to this can eliminate the effect of random and unsystematic errors, such as careless mistakes during data collection, the study will also have high reliability\textsuperscript{151}.

A general source of error is the fact that we were stationed in Finspong the whole time and visited Lincoln only two days. This meant that we had better information about I4 Procurement in Finspong. This was unavoidable, but we prepared our visit in Lincoln very carefully to be able to get as much information as possible. Another source of error is changing and new information which was presented during the thesis work.

\textsuperscript{151} Esaiasson et al (2004)
5.7.1 Method Problems

Some problems concerning the method are connected to questionnaires and personal interviews.

**Questionnaire**

When using a questionnaire, you do not have the possibility to clarify questions and straighten out misunderstandings. This is an important aspect if the questions are complex and demand open answers.\(^{152}\) We used fixed response options and tested the questions to make sure that they were not perceived as complex. We used both test persons from the intended population and outsiders. To improve the answer frequency, we made use of the purchasing managers, asking them to encourage the staff to fill in the forms. According to the guidelines suggested by Lekvall and Wahlbin, we also made an effort to make the forms look professionally and interesting, and we sent reminder e-mails to those who did not reply.\(^{153}\) When dealing with questionnaires, there is a risk for defective reliability, such as careless mistakes when transferring the information from the paper forms to the computer.\(^{154}\) This was avoided since all handling was made electronically.

Another source of error is that different people may have perceived the competency levels in different ways. We tried to avoid this by carefully defining the different levels. Differences between the modesty of men and women and between Swedish and English respondents may have influenced the results. There is also a risk that the respondents have marked a too high level of competency to look good. We tried to handle this by ensuring them anonymity and that no individual responses would reach any manager. Another problem was that some people did not answer all questions or answered incorrectly, e.g. by marking more than one alternative. It is also possible that some of the respondents have underestimated their level of competency. For example, ‘Expert level’ might have been understood as an unapproachable level, even though what was meant was that they should never experience any problems in their work due to lack of a certain competency.

**Personal Interviews**

Some unwanted effects, known as interviewer effects, can arise in the interaction between interviewer and respondent. The interviewer can, unaware of, influence the respondent and guide the responses in a certain direction. These influences can consist of, for example, facial expressions or certain articulation in the questions. It can also be taking notes or listening in a selective way when receiving the responses. Being aware of the potential effects and good preparation reduces these problems.\(^{155}\) To practice posing the questions in a ‘neutral’ way, test interviews were made in advance.

Another issue with interviews concerns the visible characteristics of the interviewer.
Depending on ethnicity, age and sex, different interviewers can receive slightly different answers from the same respondent. This is especially apparent if the interview concerns a delicate or emotional subject.\textsuperscript{156} There is not much to do about our visible characteristics, but during the interviews we tried to act professionally and to follow the “dress code” of the office environment.

The reliability of data collected from interviews may be influenced by poor notes, tiredness, stress and language problems\textsuperscript{157}. To deal with this, all interviews were recorded and printed out afterwards. We also checked with the interviewees if we could pose additional questions later if needed, something that everyone accepted. Some people may think that it is uncomfortable to be recorded. Before every interview we therefore made sure that the interviewee agreed upon being recorded and we started the interviews with some general questions, off the subject, to make the interviewee feel relaxed and care less about the recorder. To guard ourselves against technical breakdowns, we always brought a backup recording device to the interviews. Also, both recorders were carefully tested before carrying out the interviews.

Another possible source of error is that several of the interviews were done in Swedish and then translated into English. During the translation there is a risk that we made errors or lost some of the essence in the interviewee’s answers.

### 5.7.2 Sources of Errors in the Planning Phase

In this phase, the purpose formulation and the specification of research questions constitute a source of error.\textsuperscript{158} We have tried to ensure a correct formulation of the purpose through many revisions after discussions with tutors and opponents. The final formulation of the purpose was also approved by the sponsor of the thesis during our half-time presentation.

When we chose how to approach our problem and what methods to use, we may have come to the wrong decisions. These questions were, once again, discussed with tutors and opponents, and their views were taken into consideration.\textsuperscript{159} When writing the frame of reference, there is a risk that we overlooked some theories that would have been interesting for our purpose. For this reason, we made interviews with purchasing professors to check if they had additional information to contribute with.

### 5.7.3 Sources of Errors in the Research Phase

Negligence during data collection and during processing of the same may lead to defective reliability.\textsuperscript{160} When collecting data through questionnaires and interviews we were therefore very careful, as described under ‘Method Problems’ above. There is a risk that the

\textsuperscript{156} Ibid.
\textsuperscript{157} Esaiasson et al (2004)
\textsuperscript{158} Lekvall P. and Wahlbin C. (2001)
\textsuperscript{159} Ibid.
\textsuperscript{160} Esaiasson et al (2004)
data collected through questionnaires were not representative for the function profile in question, for example due to low response frequency. The response frequency in our case was very high in general. For one of the groups, however, it was only 60%, and hence there is a risk that these responses were not entirely representative for the group.

There is a risk that the mapping of level of competencies is not correct, due to individuals’ misinterpretation, overrating or underrating. We are aware of this risk, but when we moved on to the analysis we had to disregard from it in order to give us a fixed base for analysis. Also, we did not accept the answers to be the absolute truth, why we also talked to people in other departments and with a few suppliers, to get their views on the competency within I4 Procurement. This was used as a way to improve the validity of our study.

The fact that we let the personnel assess their level of competency themselves is a likely source of error. A changed method for assessing the level of competency might have provided us with a different result leading to different conclusions. An alternative way would have been to let the manager for the function profiles assess the mean competency level within the profiles. We did not choose this method since we think a larger source of data should provide a better result.

5.7.4 Sources of Errors in the Analysis Phase
A possible source of error in this phase is misinterpretations of used theories or defective usage of tools and models. To obtain guidance during this phase, we followed the methodology of Silf Competence AB. This should have minimised the risk of us taking wrong decisions.

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161 Lekvall P. and Wahlbin C. (2001)
6 Required Roles within Procurement

In this chapter, roles which will be crucial in the future are identified and the competencies required to fulfil the roles are described. The result is summarised in a matrix where the relation between different requirements is shown.

6.1 Problem Approach

In chapter 4.2.1 the following research questions were formulated concerning crucial roles:

1. What roles within procurement will be crucial in the future?
2. What competencies are required to fulfil each role?

As described in chapter 4, different roles will be identified taking van Weele’s purchasing process model (see figure 6.1) as a starting point.

![Figure 6.1: The purchasing process](image)

This model contains all tasks included in a purchase, from specification of product to follow-up and evaluation. These tasks will most probably be the same in the future, even though some tasks will be accomplished differently. Only tasks affected by the macroeconomic trends described in the frame of reference will be discussed. The different steps in the model will be transformed into roles (e.g. ‘Defining specification’ becomes ‘Definer of specification’). These roles are named ‘Primary roles’, whereas roles needed to perform the primary roles are called ‘Support roles’. Every role description will then end up in a list of needed competencies and possibly additionally needed roles. Besides, theories in the frame of reference gave indications on competencies which will be required by all roles in the future. These are named overall competency requirements and are discussed in connection with a matrix which summarises all required roles.

Before starting to identify roles, however, a few assumptions that are important for the remainder of this chapter are discussed. The assumptions concern preconditions that are likely to change in the future. Apart from these assumptions, other preconditions are expected to stay more or less the same as today.

6.2 Assumptions

To answer what roles will be important in the future, some assumptions need to be made concerning the procurement organisation and development of some of the function profiles.

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162 Adapted from van Weele A.J. (2005), p.13
Theories in the frame of reference as well as interviews with purchasing managers and production managers at I4 have shown that the current responsibilities of buyers and senior buyers are not optimal. It is therefore assumed that an organisational change which will make them contribute better to competitive advantage for I4 will be realised beyond 2010. These assumptions are described in chapter 6.2.1 and 6.2.2 below. Besides, an assumption concerning the future of Procurement Controlling has been made, since the frame of reference indicated that procurement technology is a suitable category for outsourcing\textsuperscript{163}. This assumption is described in chapter 6.2.3. For a deeper description of the function profiles affected by the assumptions, please refer to chapter 7.1.

6.2.1 Core Engine

At Core Engine in Finspong, buyers are releasing orders based on the contracts drawn up by senior buyers. This separation of strategic and operational responsibilities is backed up by both Axelsson et al and Monczka et al\textsuperscript{164,165}. However buyers are deliberately sitting close to senior buyers to draw their attention when problems with suppliers occur. Being involved in reactive problem solving makes it hard for senior buyers to concentrate on strategic work, and this makes the separation less effective.

Axelsson et al propose procurement personnel to be increasingly co-located with their internal customers to achieve greater understanding of requirements, planning and integration opportunities and thereby make the sourcing organisation more responsive\textsuperscript{166}. This development is in line with what the production manager and the purchasing manager at Core Engine in Finspong think is a possible way to organise Core Engine in the future, even though it would have both positive and negative effects. Releasing and ordering would then be moved closer to where the material is needed, i.e. in the production. In Lincoln, procurement is partly decentralised already, and in discussion with managers at Core Engine in Finspong, the conclusion was reached that this development is realistic for both locations.

In a very long term future, the staff in the production may place the orders themselves. According to Waernborg, responsible for purchasing educations at Silf Competence AB, this can be handled by personnel having other primary tasks; the ordering process will be so automated that anyone can place the order\textsuperscript{167}. In a closer future, however, there will still be buyers responsible for processing orders between the logistics planning and the production. We assume that operative buying will be decentralised so each buyer will be stationed at the manufacturing or assembly group which he or she is buying for. They would then be involved in the day-to-day work, increasing their responsiveness in case of, for example, a

\textsuperscript{163} The Global CPO Survey (2005)
\textsuperscript{164} Monczka et al (2002)
\textsuperscript{165} Axelsson et al (2005)
\textsuperscript{166} Ibid.
\textsuperscript{167} Waernborg J. (2005-11-04)
quality problem or broken parts during manufacturing. To let buyers focus on planning instead of administrative work, the use of e-procurement tools must be completely functioning.

To prevent buyers from dealing with expediting and fully concentrate on value adding activities, problems which exist in Finspong today with lack of suppliers and inferior contracts must have been solved before this transition takes place. Whether these problems can be solved or not mainly depends on the performance of senior buyers, who are responsible for contracting. No need for trouble shooting is also a prerequisite to avoid different buyers to complain on the same suppliers, since this decentralisation would mean several interfaces to each supplier. However, the advantages with closeness between buyer and production may not be more important than the communication between buyer and senior buyer/supplier for all commodities, and a more in depth study is needed to analyse which buyers will be affected by the decentralisation. Buyers not part of the future decentralisation, if any, will probably not need other competencies than today, except more skills within e-procurement. They will therefore not be affected by this study. The conclusions of the preceding discussion are summarised below:

- Buyers will be decentralised and stationed together with their internal customers in the production
- Senior buyers will have to ensure first-class performance by their contracted suppliers to enable buyers at Core Engine to focus on planning instead of trouble shooting.

6.2.2 Packaging

At I4 Procurement in Lincoln and at Packaging in Finspong, both buyers and senior buyers are responsible for everything from supplier selection to ordering. At Packaging in Finspong they are also responsible for expediting, which according to the purchasing managers in Finspong is a great advantage compared to Lincoln. In Lincoln buyers tend to care about their own responsibility only and do not care if the goods are delivered or not as long as it has been ordered, because expediting is handled by material schedulers in the production. This ‘silo’ sight will probably be an untenable situation in the future and it is therefore assumed that buyers at Packaging in Lincoln will be responsible for expediting too in the future.

Another difference between Packaging in Finspong and in Lincoln is the complexity in the commodities bought. In Lincoln bits and pieces are bought because nearly everything is manufactured in-house, whereas in Finspong whole systems are bought. The resources needed in the production at I4 in Lincoln are therefore more sensitive for changes in volumes than I4 in Finspong. In addition, as the competition increases, I4 in Lincoln will have to find more competitive manufacturers than themselves and hence it is assumed that their buyers will also buy complex systems in the future. This assumption is supported by I4’s strategy to move from component purchase towards system purchase. When buying
complex systems, it is hard to hand over the responsibility to an expeditor at a certain stage, since the entire purchasing process becomes more complex. We therefore expect buyers at Packaging in both Lincoln and Finspong to be responsible for everything from supplier selection to expediting of complex systems beyond the year 2010. The upcoming competency requirements on buyers in consequence of macroeconomic trends will therefore be the same as the requirements on senior buyers, in spite of the fact that this assumption is contrary to the trend towards increased specialisation.

The conclusion of the preceding discussion is:

- Packaging in Lincoln will buy more complex systems in the future
- Both buyers and senior buyers will be responsible for all steps in the purchasing process

### 6.2.3 Procurement Controlling

From the frame of reference it may be concluded that procurement technology is a suitable category for category outsourcing. However Siemens PGI has the development of procurement technology in-house as part of the central organisation IBS, and at each location consultants are stationed to implement new tools. The managers of methods/controlling in Lincoln and Finspong do not think that procurement technology will be outsourced in the future. They claim that those implementing e-procurement tools need to be acquainted with the specific needs of Siemens PGI. The appropriateness with a centralised procurement technology function is discussed in an empirical study conducted by Croom, who suggests that a certain economy of scale is needed in order to make an own function defendable. I4, being part of the large Siemens group, certainly has the required economy of scale. This in combination with the views of the affected managers leads to the conclusion that procurement technology will be kept indoors for I4 beyond 2010, and therefore competency requirements for consultants will be studied.

The conclusions of the preceding discussion are summarised below:

- Procurement Controlling will continue to be kept in-house and future requirements on function profiles within this group will therefore be addressed in this study

### 6.3 Required Roles Based on the Purchasing Process

We will now start identifying different required roles and competencies based on the purchasing process. However, when discussing the importance of assuming many of the roles, it should be clarified that the required competency levels will vary not only among different function profiles, but also among people assigned the same profile. This can be
argued based on the purchasing product portfolio presented by van Weele\textsuperscript{170}, showing that the requirements on the function profile depend on the supply risk and the impact on the bottom line of the product in question (see figure 3.3). This is very apparent for those function profiles involved in buying material from suppliers. For those profiles, the competency requirements should be differentiated according to the types of bought products. By studying the product portfolio it can be concluded, among other things, that the need of cross-functional co-operation is smaller when buying less complex products. It is also indicated that logistic skills and skills within usage of e-tools are more desired when dealing with routine products.

The need for differentiation of competency requirements should be kept in mind during the gap analysis in chapter 8.2. This differentiation is of interest, since it was shown during our study that all the different product types are represented within I4 Procurement. It also came to light that the location of a product in the product portfolio somewhat depends on competitors and on the current state of the market. Today, for example, there is a stiff competition for material, mainly from aerospace. This has resulted in previous routine products moving towards bottleneck products. Another finding was that many products that could have been leverage products have instead become strategic products, since the product specification used by I4 is often connected to a certain supplier.

6.3.1 Primary Roles
Below, primary roles emanated from van Weele’s purchasing process will be identified. Also, competencies and support roles required by each primary role will be identified.

Step 1 - The Role as Definer of Specifications
It is often advantageous to involve the supplier in the specification work to make use of its experiences and competencies. It is probable that this kind of co-operation will be more common in the future as the competition between supply chains get tougher.

To be the link between different departments in the own company (e.g. the design function) and the supplier is an important task for the purchaser when defining a product specification. This requires the purchaser to assume the role as a \textit{project manager} as well as a \textit{relationship manager}. These roles are described in chapter 6.3.2.

When acting as a link between the own company and the supplier, the purchaser needs to be able to speak the language of many different functions. This requires some technical skills, including product knowledge, knowledge about government legislation (in particular when dealing with suppliers from other parts of the world) and about total quality management (TQM).\textsuperscript{171} TQM is a way for I4 Procurement to contribute to competitive advantage of the company. Ensuring high quality from suppliers, leads to lower quality related costs and

\textsuperscript{170} van Weele A.J. (2005)
thus a lower total cost for I4. The importance of quality management is also something that is emphasised by Business Excellence, another department at I4.

In this process step, socially responsible procurement organisations have the opportunity to minimise the usage of non-renewable materials.\textsuperscript{172} They can also specify that the product should be produced using environmentally sound process technologies\textsuperscript{173}. According to van Weele, however, purchasing social responsibility (PSR) is primarily an issue of importance for consumer goods companies with a high brand image and reputation, and not so much for companies with industrial customers.\textsuperscript{174} From this reasoning one may argue that PSR is of less importance for I4, but when considering the strong Siemens brand and the large group of companies within Siemens that are involved in consumer products, the PSR issue should not be neglected. Also, if Axelsson’s predictions concerning emerging regulations come true\textsuperscript{175}, PSR will be a requirement on procurement. Altogether, we think that an actor on the global market with a strong and well known brand, such as Siemens PGI4, should be aware of PSR and of demands from stakeholders. The company realises the importance of this and social responsibility is included in the points in the long term future road map presented in chapter 2.3.3. Increased stakeholder demands on social aspects is also one of the consequences emanated from the trend concerning changing consumer patterns\textsuperscript{176}. It may become an important issue in the long term, and the development of regulations should be carefully monitored.

The following qualities will be required by the role as a definer of specifications:

a) Knowledge about technical features of the bought product  
b) Knowledge about technical features of the end product  
c) A positive attitude towards learning more about the components  
d) Knowledge about relevant governmental legislation  
e) Skills within TQM  
f) Knowledge of different materials’ and processes’ effects on the environment  
g) Awareness of PSR issues  

The following additional roles will be required by the role as a definer of specifications:

h) Project manager  
i) Relationship manager

**Step 2 - The Role as Selector of Supplier**  
The trends described in the frame of reference have a large impact on the supplier selection

\textsuperscript{172} Idowu S.O. and Towler B.A. (2005)  
\textsuperscript{173} Simpson D.F. and Power D.J. (2005)  
\textsuperscript{174} van Weele A.J. (2005)  
\textsuperscript{175} Axelsson B. (2005-09-30)  
\textsuperscript{176} van Weele A.J. (2005)
process. As stated in the Global CPO Survey, most companies intend to increase their sourcing in emerging regions\textsuperscript{177}. According to the I4 procurement strategy, this is I4’s desire too, with focus on America and Asia. Today, more than 80% of the suppliers are found within Europe, but the goal is that equal shares of material and services will be sourced from Europe, America and Asia in 2015 (this is described in chapter 2.3.3). This suggests that I4 will increase its global sourcing very much.

When sourcing globally, the entire world is regarded as a potential field of suppliers. Supplier performance\textsuperscript{178} and competitiveness will still be important selecting criteria, but some new criteria are pointed out by different authors. Iandoli et al emphasise variables such as global culture versus national culture and global efficiency versus local responsiveness.\textsuperscript{179} Another criteria brought up is country risk\textsuperscript{180}. Because of the globalisation and the aim of I4 Procurement to forge strategic alliances with suppliers, which implies supplier base reduction, the vulnerability of the supply chain to disturbances will increase. In addition, the global CPO Survey shows that the importance of taking supply chain security into consideration when selecting supplier will increase in the future, and beyond 2010 the role as selector of supplier must therefore assume the role as a risk manager.\textsuperscript{181} Qualities required by this role are described in chapter 6.3.2. To be able to source globally, understanding of worldwide supply markets, market analysis and development of complex strategies is also necessary, and Axelsson points out the need for language proficiency and intercultural communication skills.\textsuperscript{182} As the process of supplier selection will progressively more be performed by cross-functional sourcing teams\textsuperscript{183}, the roles relationship manager and project manager are required in the role as selector of supplier. A positive attitude towards travelling is also required since selecting a supplier involves visiting its facilities.

Some authors think that also more social aspects will need to be included in the supplier selection process\textsuperscript{184}. This may be the case if new regulations emerge, which Axelsson expects it to do\textsuperscript{185}, but PSR aspects still get little attention from companies today\textsuperscript{186}. With the same motivation as in the previous process step, we think that I4 Procurement should give attention to PSR issues also in the supplier selection process.

When selecting suppliers, cost analytical skills and, when more criteria are to be considered, a holistic view in order to evaluate the total cost of different alternatives is needed. The

\textsuperscript{177} The Global CPO Survey (2005)
\textsuperscript{178} Schorr J.E. (1998)
\textsuperscript{179} Iandoli et al (2003)
\textsuperscript{180} Ibid.
\textsuperscript{181} The Global CPO Survey (2005)
\textsuperscript{182} Axelsson B. (2005-09-30)
\textsuperscript{183} Monczka et al (2002)
\textsuperscript{184} Ibid. and Maignan et al (2002)
\textsuperscript{185} Axelsson B. (2005-09-30)
\textsuperscript{186} The Global CPO Survey (2005)
importance of a holistic view, that is the ability to see the broader picture, is emphasised by both Service (I1) and Oil & Gas (I6). This since I1 and I6 has other priorities than I4 and buyers therefore need to take different requests into consideration to optimise the supplier selection with respect to all parties’ conditions. Some technical skills, such as knowledge about production technology will also support the selection.

Evaluation and selection of suppliers in a global market requires the appropriate techniques to manage large amount of data, since there is such a large number of potential suppliers. Many of the purchasers’ tasks will be facilitated by the use of different e-tools, and suppliers can for example be selected by means of e-auctions. This requires computer literacy, a favourable attitude towards usage of e-tools and data base management skills.

The following qualities will be required by the role as selector of supplier:

- Knowledge concerning culture and traditions, that may be relevant for the relation of conceivable suppliers
- Skills within market analysis
- Skills within development of purchasing strategies
- A positive attitude towards travelling
- Awareness of PSR issues
- Skills within cost analysis (ability to analyse the impact of different decisions on total costs)
- Technical features of the bought product
- Database management
- Internet searching
- Usage of e-procurement tools

The following additional roles will be required by the role as selector of supplier:

- Relationship manager
- Project manager
- Risk manager

Step 3 - The Contracting Role

Since I4 has an expressed desire to source more globally, this will require additional competencies in terms of ability to negotiate and develop global contracts. According to Monczka et al, differences between cultures can cause misunderstandings and additional preparation to learn about the counterpart’s customs is needed before conducting any international negotiation. There may also be legislative issues to take into consideration. Monczka et al further state that patience and an honest and polite attitude are always

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188 Axelsson et al (2005)
required to succeed in an international contracting process.\textsuperscript{190} When sourcing globally, the suppliers are spread all over the world. The purchaser assuming the contracting role should therefore have a positive attitude towards travelling, since personal meetings are important in the creation of a relation. This also requires the role as a \textit{relationship manager} since it leads to much communication in different languages.

I4 Procurement is in many cases responsible for setting up frame agreements for Service (I1). Purchasing managers at I1 in both Finspong and Lincoln express that this sometimes leads to conflicts between the departments, since I4 focuses on costs and quality, whereas I1 focuses on speed and responsiveness. I1 demands better understanding of each others’ businesses, so that I4 gives greater attention to the after market when setting up agreements with suppliers. To be able to take the desires of different situations into consideration, the purchaser assuming the contracting role needs to be analytic.

When contracting an outsourcing agreement, van Weele suggests parties to agree upon the use of penalties. This can reduce the risk that the supplier deviates from the agreed scope of work. Furthermore the purchaser should make sure that the partner is in agreement with the importance of a co-operative relationship.\textsuperscript{191} This requires that profit is shared between both parties (a win-win situation) and the role as a \textit{relationship manager} is again of importance. When outsourcing increases, it is therefore important that purchasers have the appropriate competencies to handle such issues. It is probable that outsourcing of non-core activities within I4 will continue to increase, since outsourcing is a particularly good solution for companies being in the stages of saturation.\textsuperscript{192} As stated in chapter 2.3.3, this is where I4 is today already.

Increased outsourcing and global sourcing lead to greater risk exposure. Languages and business practices create complexity that may not be present when sourcing locally, and different currencies must be managed\textsuperscript{193}. Mitigating risks in the supplier network is part of the procurement strategy of I4 and during contracting the role as a \textit{risk manager} is therefore needed.

From the discussion above, it is argued that the following characteristics will be required by the contracting role:

\begin{itemize}
  \item a) Patience
  \item b) An honest and polite attitude
  \item c) A positive attitude towards travelling
  \item d) Analytical skills
  \item e) Knowledge about the counterparts’ customs, culture and legislation
\end{itemize}

\textsuperscript{190} Ibid.
\textsuperscript{191} van Weele (2005)
\textsuperscript{192} Ibid.
f) Knowledge about the benefits and the importance of a close relation

g) Knowledge about the importance of negotiating penalty clauses

h) Knowledge about the importance to reach a win-win situation

The following additional roles will be required by the contracting role:

a) Relationship manager

b) Risk manager

**Step 4 & 5 - The Role as Order Releaser/Expediter**

These two operative steps of the purchasing process are closely connected and are therefore discussed together. Gonzalez states that operative purchasing tasks will be facilitated by the use of information technology, giving more time for strategic issues. At the same time the development of information technology will, according to many of the studied authors, reduce the need for operative buyers because their tasks will be facilitated and reduced by automated tools. One possible development, according to Axelsson et al, is that ordering in the future will be more and more performed by the users in need of the material. One role needed within procurement would then be to facilitate the possibilities for users to perform the purchase, i.e. an order facilitator. This role is described in chapter 6.3.2.

As stated in chapter 2.3.3, Siemens aims to increase the use of the Internet to make the company more efficient and competitive. This is in line with Gonzalez’s statement above and means that skills within usage of e-procurement tools will be required by the role as order releaser/expediter.

I4 Procurement wants the possibility to supply from different regions of the world so that purchases can be adapted according to current currency rates (i.e. to always pay in the most favourable currency). This means that buyers will need to keep themselves informed about different sourcing markets’ currency rates and, as stated in the strategy document, exchange rate management will become more critical. A holistic view and the ability to judge the advantages with different possibilities, i.e. analytical skills, will be needed. When using global suppliers, the choice of where to place the order should not be based on the currency rate only. Also, distance, risks in different markets etc need to be judged and a logistic understanding will be very important to carry out ordering successfully. Also, distance, risks in different markets etc need to be judged and a logistic understanding and the role as risk manager will be needed to carry out ordering successfully. Another required role will be relationship manager, since the tasks of the order releaser/expediter will include much communication with suppliers.

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194 Gonzalez et al (2001)
195 Axelsson et al (2005)
The following competencies will be required by the role as an order releaser/expediter:

a) Skills within usage of e-procurement tools  
b) Exchange rate management  
c) A holistic view (take different factors into consideration when taking decisions)  
d) Analytical skills  
e) General logistic skills

The following additional roles will be required by the role as order releaser/expediter:

f) Relationship manager  
g) Risk manager

Core Engine
To make the future decentralisation of procurement staff at Core Engine serve its purpose, additional competencies will be required by those responsible for ordering and expediting. According to the assumptions in chapter 6.2.1, each buyer will be stationed at the manufacturing or assembly group which he or she is buying for. This is in order to be involved in the day-to-day work and hence increase the responsiveness in case of, for example, a quality problem, manufacturing disturbance (e.g. broken parts) or re-planning. The buyers must be able to plan with respect to such changing conditions. To give time for this, ordering and expediting must be facilitated by the use of e-tools and information systems with correct data must be available. Hence, skills within usage of e-procurement tools and IT knowledge will be even more critical for the role as order releaser/expediter at Core Engine. Also, the following additional competency will be required by the role as an order releaser/expediter at Core Engine:

h) Planning with respect to changing conditions in production, deliveries or forecasted demands

Step 6 - The Role as Supplier Developer
Step 6 in the purchasing process is actually called follow up and evaluation. To assure that the supply chain is and remains competitive, follow up and evaluation of suppliers is indeed important, but the study of ongoing trends did not indicate any major changes of this process step. However, we choose to include yet another process in this step, namely supplier development. According to Iandoli et al, companies and their suppliers must become learning organisations to tackle the global and complex environment. Supplier evaluation is then a long term, strategic and ongoing process.196 In the context of learning organisations, supplier development is an interesting issue and we therefore define the role as supplier developer. Axelsson et al emphasise the importance of external integration

where procurement has joint development or improvement teams with key suppliers\textsuperscript{197}. If the supplier evaluation indicates problems with a supplier it is often preferable to deal with the problems instead of choosing a new supplier, which would require efforts to create a good relation. At I4, it often takes half a year to start up with a new supplier, and the process consumes much resources.

If the purpose of a development project is to improve quality, both technical and cost analytical skills are required. The development projects could also be focused on introducing new process technologies or other concepts to reduce lead time. Simpson and Power mention that one opportunity for procurement to develop their suppliers is by introducing environmental performance measurements and environmentally sound process technologies to them\textsuperscript{198}. According to Monczka et al, management of suppliers will gradually more belong to cross-functional teams\textsuperscript{199}. In line with this reasoning, any development project should be executed in cross-functional project teams with representation from both I4 and from the supplier. The purchaser as a supplier developer thus needs to assume the role as relationship manager. Besides the competencies connected to this role, the supplier developer also needs technical and economical skills in order to carry out the development projects. When dealing with suppliers from foreign countries, a cultural understanding, language skills and a positive attitude towards travelling are also important.

According to managers for supplier development engineers at I4, understanding of suppliers’ processes, the ability to implement Six Sigma at suppliers, result-orientation and project leader skills will be the most important skills for the supplier development engineers in the future. This indicates that the in chapter 6.3.2 described support role as project manager will be needed. The project manager role will be important also because the supplier developer is responsible for managing a team constituting of people with the different competencies required to develop the supplier in question. It is not reasonable to assume that the supplier developer possess all the competencies himself. CSR-factors are included in the lean assessment of suppliers, which takes place today, but the managers think there will be even more focus on these factors in the future. One of the managers mentions that a weakness so far has been the limited development of suppliers on the emerging markets.

To be able to develop suppliers, up-to-date knowledge about ways to improve suppliers’ results is needed. Continuous competency development and a good ability to accumulate human capital (ability to learn and to find relevant sources of information) are needed. The importance of this ability is emphasised by Axelsson et al\textsuperscript{200}.

\textsuperscript{197}Axelsson et al (2005)
\textsuperscript{198}Simpson D.F. and Power D.J. (2005)
\textsuperscript{199}Monczka et al (2002)
\textsuperscript{200}Axelsson et al (2005)
The following qualities will be required by the role as a supplier developer:

a) Total quality management  
b) Skills within cost analysis (ability to analyse the impact of different decisions on total costs)  
c) A positive attitude towards travelling  
d) Knowledge about the products in question  
e) Knowledge about the processes in question  
f) Knowledge about the culture of suppliers in question  
g) Knowledge about different materials’ and processes’ effects on the environment  
h) Awareness about CSR issues  

The following additional roles will be required by the role as a supplier developer:

i) Relationship manager  
j) Project manager  

6.3.2 Support Roles  
In the preceding chapter it has been concluded that some support roles will be required in order to carry out the primary roles. These support roles are described below. In addition, the role as purchasing manager is described because the theories in the frame of reference have indicated that the trends will have a great impact on the requirements on this role.  

The Role as Purchasing Manager  
As the macroeconomic trends will lead to reduced operative tasks and more strategic work for I4 Procurement, purchasing managers will need to ensure that the organisation has developed competencies that are appropriate to the changes.\textsuperscript{201} Van Weele mentioned that bringing changes into current settings and positions will be a great challenge for top management. He claims that superior management of change is a key competency and that leadership and power of initiative and ability to realise improvements is required at Chief Procurement Officer level\textsuperscript{202} According to Christopher, team work capabilities and planning skills, as well as cross-functional understanding and management, will characterise successful supply chain managers in the future\textsuperscript{203,204}. This indicates that the roles \textit{project manager} and \textit{relationship manager} are needed for the role as purchasing manager.  

Yukl defines leadership as ‘ the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating

\textsuperscript{201} \textit{Christopher M. (1998)}  
\textsuperscript{202} \textit{van Weele A.J. (2005-10-18)}  
\textsuperscript{203} \textit{Christopher M. (2005)}  
\textsuperscript{204} Ibid.
individual and collective efforts to accomplish the shared objectives’. This definition is highly relevant for a purchasing manager. It further underlines the importance of management of change as well as of interaction and communication, which is included in the above mentioned roles project manager and relationship manager.

Purchasing managers are involved in long-term strategic decisions which will have an impact on future risks for the company itself, as well as for the whole supply chain. Such decisions can for example concern outsourcing or a single sourcing strategy. This requires analytical skills and shows the need of the role as risk manager.

Altogether, the following competencies will be required by the role as purchasing manager:

- Management of change
- Power of initiative and realisation of improvements
- Planning skills
- Cross-functional understanding
- Analytical skills

The following additional roles will be required by the role as purchasing manager:

- Project manager
- Relationship manager
- Risk manager

**The Role as Project Manager**

As described in the frame of reference, the purchasers need to undertake more and more complex tasks and highly educated people are desired. In this context, the role as a project manager is becoming increasingly important in many situations. In the role as a definer of specifications and the role as supplier developer, co-ordination and management of resources both internally and externally is required. To be a successful project manager, skills within written and oral communication is needed. These qualities are connected to the role as a relationship manager, a role equally important for the purchaser as a project manager. As a project manager, skills are also required within persuasion, leadership, conflict resolution and problem solving. An additional important quality for project managers is presentation skills, since this role involves much communication and presentations within the project team.

The following competencies will be required by the purchaser as a project manager:

a) Project management  
   i. Planning and co-ordination skills
b) Team work
c) Leadership
d) Conflict resolution
e) Persuasive powers
f) Presentation skills
g) Problem solving abilities

The following additional role will be required by the purchaser as a project manager:

h) Relationship manager

**The Role as Relationship Manager**
Many of the purchasing tasks require co-operation and skills within management of external and internal relations. A study commissioned by CIPS (Chartered Institute of Purchasing and Supply) found project management and networking skills to be vital competencies as a result of the enhanced integration with other business functions.\(^{207}\)

To be a successful relationship manager, communication is crucial, whether it is an internal or an external relation. Large and Gimenez point out oral communication skills to be one of the most important competencies to maintain a successful supplier relationship. The quality of the relation, measured in terms of understanding, trust and readiness to help and to co-operate is positively affected by highly developed communication skills.\(^{208}\) The importance of communication is also something that is emphasised by purchasing managers at Service (I1). They claim that better communication between I4 and I1 will increase the understanding for each others’ businesses and make I4 better realise the requirements from the after market.

The international business language is English, so this is of course the most important language to control. This gives an advantage to I4 in Lincoln. Along with the increased globalisation, however, additional languages will become an asset.

The following competencies will be required by the purchaser as a relationship manager:

a) Team work and co-operation

\(^{207}\) The Future of Purchasing and Supply (2004)
\(^{208}\) Large R.O. and Giménez C. (2004)
b) Written communication skills
   i. In native language
   ii. In English

c) Oral communication skills
   i. In native language
   ii. In English

d) Skills within foreign languages

The Role as Risk Manager
As mentioned in chapter 2.3.3, part of the procurement strategy of I4 is to mitigate risks in the supplier network. I4 Procurement therefore needs to work with risk management throughout the whole supply chain to reduce the consequences or probability of occurrence of risks.\textsuperscript{209,210} To give the suppliers a reason to implement a supply chain risk management (SCRM) approach themselves, there must be a win-win situation for both parties, with shared risk and shared profit. This requires trust between the parties and an open and honest communication.\textsuperscript{211} The role as a relationship manager is therefore needed to succeed as a risk manager too.

Norrman and Jansson propose risk management work to be performed according to the process in figure 6.4 below.\textsuperscript{212} From this process it can be concluded that the role as a risk manager needs analytical skills to identify risks at every significant link along the supply chain. To understand the potential consequences of risks the risk manager needs to have good knowledge about the objectives and values of the company.

\begin{figure}[h]
\centering
\includegraphics[width=0.8\textwidth]{figure6_4.png}
\caption{The risk management process.}\textsuperscript{213}
\end{figure}

From the discussion above, it is argued that the following competencies will be required by the role as a risk manager:

a) Knowledge about the importance to reach a win-win situation
b) Analytical skills
c) Skills within risk analysis (ability to analyse the impact of a purchasing decision on supply chain risks)
d) Knowledge about the objectives and values of the company

\begin{tabular}{llllll}
\textsuperscript{209} Christopher M. (2005)\hfill & \textsuperscript{210} Norrman A. (2005-09-28)\hfill & \textsuperscript{211} Norrman A. (2005-09-28)\hfill & \textsuperscript{212} Norrman A. and Jansson U. (2004)\hfill & \textsuperscript{213} Adapted from Norrman A. and Jansson U. (2004), p. 439
\end{tabular}
The following additional role will be required by the role as a risk manager:

e) Relationship manager

**The Role as Order Facilitator**
The need of an order facilitator will increase if the responsibility for releasing and ordering will be internally outsourced to those using the material. According to Monczka, such a role should be responsible for establishing e-procurement systems and for empowering users through Internet based system\(^{214}\). I4 has an explicit desire to increase the use of e-procurement as well as moving ordering work closer to where the material is used, and the order facilitator is therefore a role of interest. To assume the role as responsible for e-procurement systems technical skills and ability to educate users and/or buyers in how to use the systems are required. Furthermore, good communication and presentation skills are desired, since they have to ‘market’ new tools among managers and people affected. This will require the roles as *relationship manager* and as *project manager*. Analytical skills and business understanding is also important in order to know which tools are needed. They also need to be constantly updated on technical development and on new tools available:

The following competencies will be required by the role as order facilitator:

- a) Pedagogical skills (to teach users how to use e-procurement systems)
- b) IT-skills
- c) Communication and presentation skills
- d) Analytical skills
- e) Business understanding
- f) Knowledge about technical progress and new tools available

The following additional roles will be required by the role as order facilitator:

- g) Relationship manager
- h) Project manager

**6.4 Comprehensive Role Model**
In the preceding chapter, roles that will be required in order to fulfil the tasks in van Weele’s purchasing process have been identified. In addition to these roles, the frame of reference has given indications on competency requirements that are not derived from the purchasing process, but nevertheless will be desired by all personnel within procurement. These requirements are discussed in the upcoming chapter.

**6.4.1 Overall Competency Requirements**
In a complex environment, where organisations, products and technologies are changing

\(^{214}\) Monczka et al (2002)
rapidly, it is important to become a learning organisation, which can adapt to ongoing changes. The ability to accumulate human capital, that is the ability to learn and to find relevant sources of information, is of uttermost importance.\textsuperscript{215, 216} The procurement organisation at I4 has been restructured many times, latest in connection with the acquisition by Siemens in 2003. The products do not change rapidly, but new tools and technologies are all the time being encapsulated in the procurement work, and the ability to learn is indeed crucial. In the complex environment, where the role of procurement is getting more and more strategic, it is also required to have employees with a higher level of education than before. A highly desired quality for all roles will be drive and power of initiative.\textsuperscript{217}

In the more strategic roles of purchasers, there is much contact with external parties and they act as representatives of the company in different situations. This requires some knowledge about the organisation; its objectives, values and strategies. These are also aspects that need to be taken into consideration when making different decisions.

The following qualities will, to some extent, be required by all identified roles:

**Learning ability**
- a) Finding it easy to accumulate human capital (to learn new things and be comfortable in a changing environment)
- b) A favourable attitude towards learning and competency development
- c) A relevant university degree (or equivalent experience)

**Organisational knowledge**
- d) Objectives
- e) Values
- f) Strategies

**Personal driving force**
- g) A power of initiative (e.g. bring up suggestions on improvements)
- h) Realisation of improvement initiatives

**6.4.2 Summary of all Identified Requirements**

The matrix in figure 6.5 below contains all roles which have been identified as crucial for the future successfulness of I4 Procurement. Roles connected directly to a step in van Weele’s purchasing process are named primary roles. These are supported by the horizontal roles which are identified as important throughout the entire purchasing process. Overall competency requirements are required by all roles, and therefore run horizontally through the whole purchasing process.

\textsuperscript{215} Axelsson et al (2005)
\textsuperscript{216} Iandoli et al (2003)
\textsuperscript{217} van Weele A.J. (2005-10-18)
Figure 6.5: This matrix shows the relation between identified requirements.
7 Connecting Roles to Function Profiles

In this chapter, the current function profiles within I4 Procurement are described in terms of tasks and responsibilities. The profiles are then connected to the different roles identified in chapter 6, in order to determine the future competency requirements for the respective profiles.

7.1 Current Function Profiles within Procurement

Here follows a mapping of the responsibilities and tasks for each function profile within the specific studied system. These function profiles are shown in figure 7.1 below. The mapping is needed to decide what roles will be relevant for each function profile in the future, which in its turn is needed to perform a gap analysis. The descriptions are based on personal interviews and existing job profiles. In addition, the assumptions in chapter 6.2 have been taken into consideration, because of its impact on the future tasks of some function profiles. The answers to the questionnaire questions concerning education, relevant experience and way of working are presented in connection with each function profile. These answers will be used in the upcoming analysis and recommendations.

Figure 7.1: The studied system. Function profiles with dashed lines are excluded in the study. 218

First, the two IBS function profiles will be described and then those belonging to IBP.

218 Adapted from internal document.
7.1.1 Key Commodity Manager

The purpose of this function profile is to achieve lower purchase costs for key commodities by co-ordinating procurement for different locations and sub-divisions. Key commodity managers also run projects to develop supplier relations and are responsible for supplier selection, contract award and supplier evaluation concerning strategically important commodities. These tasks are performed in collaboration with a buyer or senior buyer. When selecting supplier, the design function and supplier development engineers support the key commodity manager in technical questions.

This profile is responsible for conducting negotiations. Most of the key commodity managers bring up financial penalties to discussion when negotiating agreements. They often emphasise the importance of a close relation and try to reach a win-win situation. In Lincoln, the key commodity managers put somewhat more effort on studying the counterpart's culture and customs and relevant legislation before an international contracting process. Key commodity managers in Lincoln also put more effort into searching for knowledge concerning corporate culture and values of potential suppliers before selecting the supplier. However, supplier risk is a selection criterion at both locations and environmental aspects are included more often in Finspong than in Lincoln.

As for formal education, all key commodity managers in Finspong have a relevant university degree, whereas only two out of four have it in Lincoln. However all key commodity managers are positive towards learning and competency development and they rarely find it hard to learn new things and to develop their skills.

7.1.2 Consultant

The consultant profile belongs to Procurement Controlling and is part of IBS 7. They consult and drive procurement organisations in utilising strategic Siemens procurement tools, and their work is supposed to be of use for all GZs where they are located. According to the board of Siemens, increased use of the Internet within all processes, including procurement, will make Siemens more efficient and competitive.

Consultants are constantly informed about new e-procurement tools and are required to contribute to an increased use of these tools. After a new tool has been developed its appropriateness and necessary adjustments is assessed by the consultant, who then introduces it to the director. Sometimes the director has the ability to decline implementation but more and more tools become mandatory to implement. The consultant educates buyers and senior buyers in how to use the tools and then the buyer or senior buyer is responsible for implementing the tool to their suppliers.

The consultants keep themselves updated on technical progress and new tools available, even more in Lincoln than in Finspong. They are all positive towards learning and competency development and all of them find it relatively easy to learn new things and to develop their skills. All consultants in Finspong have a relevant university degree, whereas
the majority in Lincoln do not.

7.1.3 Purchasing Manager
There is one purchasing manager for Core Engine and one for Packaging at each location. They lead forward the strategic work of their department and identify improvement areas. They also support their staff when needed, for example when major supplier problems occur or during complex contracting processes. Another responsibility is development and recruitment of staff.

When interviewing the purchasing managers, they all claimed that they have future competency requirements in mind during new recruitment and that the competency requirements are higher than some years ago. They think a holistic view is important but acknowledge that this is lacking among most of the staff today. At Packaging in Lincoln it is stated that a commercial education is preferred. It is beneficial with some technical knowledge, but not as important as the commercial. In Finspong it is the mixture that is looked for, with more emphasis on technical knowledge. Also, the answers to the questionnaire questions concerning relevant education and experience indicated that the demands on technical skills and on formal education are lower in Lincoln than in Finspong. The way in Lincoln seems rather to be to reach positions through advancing within the company, since almost all employees stated that they have, for their responsibilities, relevant professional experience. In Finspong, on the other hand, many fresh university graduates have been employed in the last years.

7.1.4 Senior Buyer
At both locations senior buyers are responsible for strategic purchasing tasks for one or several kinds of commodities. As stated above, procurement of commodities considered as strategically important are monitored by key commodity managers and in this case senior buyers are working in close co-operation with the key commodity manager. Suppliers delivering non-strategic commodities are managed by the senior buyer alone.

There is an organisational difference between Finspong and Lincoln which concerns human resource responsibility. Most senior buyers in Lincoln have human resource responsibility for a group of buyers, whereas at Packaging in Finspong only two senior buyers, so called team leaders, have human resource responsibility. At Core Engine in Finspong, no senior buyer has it.

The assumptions described in chapter 6.2 mainly concern buyers but will affect the responsibilities of senior buyers too. The following description of senior buyers’ tasks and responsibilities is therefore based on the assumptions made in consultation with purchasing managers and the production manager in Finspong, and is only partly based on current job profiles and interviews with senior buyers. Because of different assumptions for Packaging and Core Engine, senior buyers’ future tasks and responsibilities are described separately for these two departments.
Core Engine
At Core Engine, senior buyers will be responsible for strategic tasks only. This will not mean any formal change for senior buyers in Finspong, whereas it will involve increased specialisation on strategic work for those in Lincoln. However, current problems in Finspong with lack of suppliers and inferior contracts must not arise if the assumption shall be applicable, and hence excellent contracting work will be crucial.

Packaging
Beyond 2010, peripheral equipment will first and foremost be purchased as whole systems. This is more or less complex depending on the characteristics of the system. Senior buyers at Packaging will be responsible for the most complex or important systems, whereas buyers will be responsible for other systems and bits and pieces. Hence, senior buyers will be responsible for all activities in the purchasing process, not only strategic tasks. This is the way purchasing is performed at Packaging in Finspong today. In Lincoln, senior buyers are responsible for activities until order release only, and their area of responsibility will therefore be enlarged in the future.

Senior buyers at Core Engine and at Packaging
One of the important tasks of senior buyers is to conduct negotiations with suppliers. Our study has shown that senior buyers in neither Finspong nor Lincoln spend much time on studying the counterpart’s culture and customs or relevant legislation before an international contracting process. As for supplier selection criteria, the senior buyers in Finspong take more environmental aspects into consideration. Also, supplier risk is somewhat more analysed in Finspong. At both locations they do some searching for knowledge concerning corporate culture and values of potential suppliers. They sometimes or always emphasise the importance of a close relation and try to reach a win-win situation with the supplier during negotiations. Most of them also bring up financial penalties to discussion.

Further, it was shown that all senior buyers but one in Finspong have a, for their responsibilities, relevant university degree. In Lincoln, only one of them has it. However, they are positive towards competency development and travelling at both locations and most of them usually find it easy to learn new things and to develop their skills.

7.1.5 Buyers at Core Engine
The responsibilities and tasks of buyers at Core Engine will be highly affected by the assumptions described in chapter 6.2.1. They will be responsible for order release, expediting, quality checks, invoicing and claim management. However, suppliers must have been selected so well and contracts should be so superior, that expediting and claim management will not occupy much of their time. Instead, buyers will focus on planning and finding excellent logistic solutions. By sitting close to the manufacturing or assembly group, which they are buying for, they will be involved in the day-to-day work and ensure that expected deliveries are balanced with the demand. E-tools will be used to minimise
administrative work load and buyers at Core Engine will add value by increasing the responsiveness of I4 Procurement.

All buyers at both locations are positive or very positive towards regular communication with suppliers, business travelling, learning more about their components and competency development in general. In addition, all of them have stated that they always or usually find it easy to learn new things and develop their skills. In Lincoln one out of three has a relevant university degree, whereas two out of eight have it in Finspong. Half of those in Finspong have relevant professional experience in comparison with all in Lincoln.

7.1.6 Buyers at Packaging
Buyers at Packaging will have the same responsibilities as senior buyers, but for less important or complex systems. However, the tasks for buyers in Lincoln will be more difficult than today because they currently buy mainly bits and pieces. Another difference for buyers in Lincoln will be enlarged responsibility for the activities in the purchasing process. Today, their responsibility involves activities up to order release only, whereas the assumption assumes buyers at Packaging to be responsible until the commodity has arrived to the assembly group.

At Packaging in Lincoln, two out of five buyers have a relevant university degree, whereas every one has it in Finspong. At both locations they are positive towards competency development and they usually find it easy to learn new things and develop their skills.

The buyers answered the same questions as senior buyers concerning supplier selection, contracting etc. At both locations they always emphasise the importance of a close relation with suppliers and they always try to reach a win-win situation. Furthermore, all of them include supplier risk as an evaluation criterion. On other aspects, such as culture and customs of suppliers and environmental issues, their concern seems to be somewhat lower than for the senior buyers.

7.1.7 Supplier Development Engineer
Supplier development engineers drive and lead supplier development projects with important suppliers to improve the technical results of these suppliers. There is no such function profile on central level but when common suppliers exist for different locations, supplier development engineers try to co-ordinate their work. This, however, is usually difficult, since different locations rarely buy exactly the same components. They are also involved in the preparatory work for supplier evaluation and selection, and their recommendations are the base for the supplier selection.

Key commodity managers and senior buyers report which suppliers need to be developed technically. There are not enough resources to develop all vital suppliers. Therefore a priority schedule is made in collaboration between the supplier development engineer and the purchasing manager.
The function profile of supplier development engineer is under development. In Finspong, they used to work mainly reactive by solving suppliers’ urgent technical problems and the supplier development engineers were technicians and quality specialists. The goal now is to work more proactively, by running lean projects to develop suppliers. In Lincoln they are already running lean projects in a formalised way and according to the manager of supplier development engineers in Lincoln, 50% of the engineers’ tasks are proactive and the other 50% are reactive. Developing a supplier should be a win-win situation for both parties. For I4, lean projects bring about reduced lead time and cost reductions.

Apart from lean projects, the proactive work involves assessment of suppliers to assure that their capacity and skills are enough to perform what is required by I4. In Lincoln there are six supplier development engineers compared to two in Finspong, and no lean project has started in Finspong yet. The two newly employed engineers work in close co-operation with the engineers in Lincoln to learn from them. One works for Packaging and one for Core Engine. Instead of being technicians and quality specialists, they shall co-ordinate specialists to solve technical problems in the development projects. The former supplier development engineer in Finspong, who worked in a more reactive way, points out that global sourcing should raise the requirements on supplier development engineers’ ability to improve suppliers’ quality. Longer distances will also make development projects more complicated as many visits are required.

Our study has shown that all supplier development engineers in Finspong have a, for their responsibilities, relevant university degree, whereas only one out of five in Lincoln has it. As for professional experience, the situation is the reversed; a higher percentage of the supplier development engineers in Lincoln than those in Finspong have professional experience. At both locations, all of them have a positive or very positive attitude towards learning and competency development, as well as towards regular communication with suppliers.

7.2 Roles Required by Each Function Profile
In chapter 6.3, roles which will be crucial in the future where identified. In order to perform a gap analysis with the competencies embedded in these roles, the required roles must be connected to existing function profiles within I4 Procurement. This matching will be performed using the above mapping of current function profiles. Table 7.1 provides the reader with an overview of roles and function profiles which will be connected.
Table 7.1: Current function profiles and future crucial roles at I4 Procurement.

<table>
<thead>
<tr>
<th>Role</th>
<th>I4 function profile</th>
<th>Key commodity manager</th>
<th>Consultant</th>
<th>Purchasing manager</th>
<th>Senior buyer</th>
<th>Buyer Core</th>
<th>Buyer Pack.</th>
<th>Supplier development engineer</th>
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<tbody>
<tr>
<td>Definer of specification</td>
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<td>Order releaser/Expediter</td>
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<td>Supplier developer</td>
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<td>Purchasing manager</td>
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<tr>
<td>Project manager</td>
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<tr>
<td>Relationship manager</td>
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<td>Risk manager</td>
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<td>Order facilitator</td>
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</table>

Below, a discussion about each crucial role follows in order to determine which roles will be required by each function profile. Some of the roles are required by the function profiles already, and other roles will be required in the future as a result of the assumptions described in chapter 6.2. As in chapter 6.3, the roles are divided into primary roles and support roles.

7.2.1 Primary Roles
The primary roles identified in chapter 6.3.1 are in this chapter connected to the function profiles within I4 Procurement.

Definer of Specification
At I4, the specification is usually performed by the design function. Key commodity managers and senior buyers are involved in the process since they are the link to the supplier. In this context they mainly have a management responsibility. The two profiles have similar tasks, even though the key commodity managers deal with strategic commodities and the senior buyers with non-strategic commodities.

At Packaging, both buyers and senior buyers will be responsible for all activities in the purchasing process. Hence, buyers at Packaging also need the role as definer of specification.

Supplier Selector
Depending on the strategic importance of the commodity delivered by a supplier, a senior buyer or a key commodity manager is responsible for selecting suppliers. At Packaging, buyers also assume this role, since they are responsible for all tasks within the purchasing process when it concerns less complex systems. Potential suppliers are assessed on several criteria, both financial and technical, in order to assure that the supplier will be able to perform what is required by I4. Supplier development engineers give support in technical questions and assess the capacity of the suppliers. However, the actual supplier selection is managed by the senior buyer, key commodity manager or buyer and from the mapping of supplier development engineers’ tasks and responsibilities; the conclusion is that supplier
development engineers do not assume the role as supplier selector.

The Contracting Role
Contracting is the responsibility of key commodity managers for strategic material and the responsibility of senior buyers for non-strategic material. At Packaging in Finspong, buyers are responsible for contracting of less complex systems. As described in the mapping of purchasing managers’ responsibility and tasks, see chapter 7.1.3, purchasing managers sometimes support their staff during complex contracting processes. But in conformity with the discussion about supplier development engineers’ involvement in the supplier selection, the conclusion is that purchasing managers do not assume the contracting role.

The Role as Order Releaser/Expediter
At Packaging in Finspong, orders are released and expedited by senior buyers if it concerns complex systems and by buyers if it concerns less complex systems. In Lincoln, expediting is currently performed by material schedulers. However, beyond 2010, buyers and senior buyers in Lincoln will have the full responsibility for both order release and expediting (see assumptions in chapter 6.2). This role will therefore be assumed by buyers and senior buyers at Packaging in both Finspong and Lincoln. At Core Engine, only buyers assume this role, and this will be the case after the assumed decentralisation too.

Supplier Developer
At I4 Procurement, the development of suppliers is performed by supplier development engineers and procurement engineers. The latter function profile develops suppliers with the aim of making the design less costly. However, as stated in chapter 4.1, this profile has been excluded from competency mapping.

The supplier development engineers’ responsibility is to improve the technical results of suppliers. This responsibility obviously demands the role as a supplier developer. Key commodity managers and senior buyers report which suppliers need to be developed, but these are not responsible for carrying out the development, and hence can not be connected to the role as a supplier developer.

7.2.2 Support Roles
The support roles identified described in chapter 6.3.2 are in this chapter connected to the function profiles within I4 Procurement.

Purchasing Manager
This role obviously belongs to the function profile with the same name. The purchasing managers within I4 Procurement lead forward the strategic work of their department and identify improvement areas. Another responsibility is development and recruitment of staff. The last mentioned responsibility also belongs to some of the senior buyers, those who have human resource responsibility for a group of buyers. This, however, does not give occasion to connect senior buyers with the role as purchasing manager, as the role as purchasing
Project Manager
As procurement is the link between the supplier and different departments within the company, it is natural that personnel within procurement manage projects involving other parties. Projects where several parties are involved are often needed to handle complex tasks which demand competencies from different departments or even companies. As a result of the globalisation and increased outsourcing, most tasks within procurement are getting more and more complex. Also, the development of information technology gives time for more strategic and complex tasks. All in all, personnel within procurement working with complex tasks which require resources from different departments need to assume the role as a project manager. Considering the assumptions in chapter 6.2, all function profiles within I4 Procurement, except buyers at Core Engine, will need to assume the role as a project manager.

Relationship Manager
With the same motivation as for the project manager role, more co-operation is needed when the tasks for personnel within procurement are getting more and more complex and strategic. Any co-operation requires communication skills and teamwork capabilities. These skills are embedded in the role as relationship manager, and consequently all function profiles which need to assume the role as project manager, need to assume the role as relationship manager too. However, even though buyers at Core Engine will not manage projects, the main idea with the assumed decentralisation is to co-locate the buyers with production to achieve greater integration opportunities. For this to be successful, buyers certainly need the role as relationship manager. Hence, all function profiles within I4 Procurement need to assume the role as a relationship manager.

Risk Manager
The analysis of the impact of macroeconomic trends has indicated that I4 Procurement will be confronted with high requirements on supply chain risk management in the future. Because of this conclusion, a research question about how supply chain risk management is handled today was formulated. The answer to this question (question 5 in chapter 4.2.2) is that it is the responsibility of all the staff within I4 Procurement to manage risks. Hence, a permanent cross-functional supply chain team does not exist, as suggested in the literature. When needed, a temporary team is formed, for example when a new supplier shall be evaluated. In addition, important suppliers are evaluated once a year on factors like logistics, technique and quality. During this evaluation, risk factors further upstream in the supply chain are supposed to be considered, but during our study it was revealed that risks are often assessed for first tier suppliers only. As supplier reduction and global and complex networks potentially lead to greater risk exposure, it is not enough to manage and mitigate the risks of the own company, since other links’ risks may have enormous and

219 Christopher M. (2005)
unexpected consequences for the own company.\textsuperscript{220} All in all, the way risks throughout the whole supply chain are handled at I4 Procurement seems to be insufficient. The possibilities to introduce a supply chain continuity team are therefore discussed further in chapter 8.4.2. However, even if a supply chain continuity team takes the overall responsibility for supply chain risk management, all function profiles taking decisions which affect the company’s risk exposure need to assume the role as a risk manager. Considering van Weele’s purchasing process, described in chapter 3.1.2, such decisions are mainly taken during supplier selection and contracting. This also agrees with the fact that the role as supplier selector and the contracting role both include the role as risk manager (this is shown in chapter 6.3.1). Function profiles responsible for supplier selection and contracting are key commodity managers, senior buyers and buyers at Packaging. In addition, purchasing managers need to assume the role as risk manager, because their strategic decisions highly affect the company’s risk exposure. When planning with respect to changing conditions it is also important that buyers at Core Engine take risk aspects into consideration, so that orders are placed at the supplier and market with the lowest risk possible.

\textbf{Order Facilitator}

The responsibility for the introduction of methods, such as e-procurement tools, belongs to consultant. Although this is an area suitable for outsourcing, the discussion in chapter 6.2.3 concluded in an assumption which states that procurement controlling will be kept in-house in the future too. Consultants therefore need to assume the role as order facilitator.

\textbf{Overall Competency Requirements}

As stated in chapter 6.4.1, the more strategic role of procurement will put demands on qualities required by all personnel within I4 Procurement, irrespective of responsibilities and tasks. Hence, qualities embedded in overall competency requirements will be required by all studied function profiles.

\textsuperscript{220} Norrman A. (2005-09-28)
7.2.3 Summary
The results from the previous discussion are summarised in table 7.2 below.

Table 7.2: Connection of roles to existing function profiles.

<table>
<thead>
<tr>
<th>Role</th>
<th>14 function profile</th>
<th>Key commodity manager</th>
<th>Consultant</th>
<th>Purchasing manager</th>
<th>Senior buyer</th>
<th>Buyer Core</th>
<th>Buyer Pack.</th>
<th>Supplier development engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definer of specification</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Selector of supplier</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The contracting role</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Order releaser/Expediter</td>
<td>X*</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Supplier developer</td>
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<tr>
<td>Purchasing manager</td>
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<td></td>
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<tr>
<td>Project manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Relationship manager</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Risk manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Order facilitator</td>
<td>X</td>
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</tr>
</tbody>
</table>

*only applicable for senior buyers at Packaging

In addition to the roles connected to each function profile, all profiles will also be required to possess the qualities included in the overall competency requirements.
8 Competency Analysis

In this chapter, the current competency levels within I4 Procurement are reported on. The competency gaps are then analysed and the consequences are discussed. The chapter ends with a discussion concerning development of competencies and roles.

8.1 Current Competency Levels within I4 Procurement

The data collected from questionnaires will now be presented. All of the studied function profiles were issued slightly different questionnaires, depending on what roles were connected to their profile. In appendix 8, as an example, the questionnaire sent to consultants can be seen. It is indicated how many of the responders that chose the different alternatives, divided by Finspong (marked F) and Lincoln (marked L).

The competencies required to fulfil the different roles have been grouped somewhat differently in the questionnaires and in the upcoming star diagram. The reason to this is that it is not very clear from the role names what competencies they symbolise.

The current level of competency within those areas important for each function profile in the future was mapped. The data collected for consultants are shown in table 8.1 below. This represents an example of the data collection. The mean value is between one and four (Basic = 1, …, Expert = 4). The shown target level is the mean value of the managers’ suggestions, adjusted up or down by the authors of this thesis, as described in chapter 5.6.1. A more comprehensive discussion and presentation of the results follows in chapter 8.2. All the findings from the competency mapping can also be seen in appendix 7; the mean value for every competency and every function profile are shown, as well as the target levels.

<table>
<thead>
<tr>
<th>Competency Current level</th>
<th>Siemens Knowl.</th>
<th>Mgt of relations</th>
<th>Communication</th>
<th>Professional Knowledge</th>
<th>Personal Driving Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average L.</td>
<td>2</td>
<td>2.44</td>
<td>4</td>
<td>2.49</td>
<td>2.67</td>
</tr>
<tr>
<td>Average F.</td>
<td>1.75</td>
<td>2.08</td>
<td>2.75</td>
<td>1.88</td>
<td>2.17</td>
</tr>
<tr>
<td>Target</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

The mapping of current competency levels, together with the desired levels, was used as input to the gap analysis.

8.2 Gap Analysis

The gaps between current competency levels and the levels required beyond 2010 will now be discussed for each of the studied function profiles. The gaps are illustrated in star diagrams. For competency areas where considerable gaps exist, the consequences for I4 Procurement are analysed and possible explanations to why these gaps exist are provided. It is also stated what specific competencies within the areas are those primarily in need of development (each competency area consists of several specific competencies).
In the star diagrams, the different levels are shown from one to four. As described earlier, level one is equivalent to basic knowledge, level two to intermediate, level three to advanced and level four is equivalent to expert knowledge. When determining the target levels, the mean value of managers’ assessments was rounded up or down depending on the indications of importance provided in the frame of reference. The target levels are the same for Finspong and Lincoln, but the current levels are separated for the two locations, so that differences can be identified and analysed. In appendix 7, the competencies included in each competency area are shown, as well as the results from the mapping and the target levels.

It should be underlined that it is not always necessary for every individual to reach the set up target levels of all competencies desired by his or her function profile. Different people can complement each other, and tasks and responsibility areas can be divided according to the conditions of different people. This is further discussed in upcoming chapters.

### 8.2.1 Key Commodity Managers

The key commodity manager is a highly strategic function profile at I4 and is considered to be one of the core functions within I4 Procurement. For this reason, the target levels have been set quite high for many of the competencies. As seen in figure 8.1 below, the gaps are relatively small for most competency areas, indicating that the staff assigned this profile have a satisfying competency level and are well suited for their tasks. Nevertheless, there are a few gaps worth noting. The largest gap for both Lincoln and Finspong is within management of relations. This is important for function profiles with high strategic importance, such as the key commodity manager. Their future work will include even more team work than today, where they must manage relations both internally and externally. This is a result of the increasing integration with other business functions \(^{221}\) and also of the general trend towards more strategic responsibilities for procurement. This is also in line with I4’s strategy to increase group wide collaboration.

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\(^{221}\) The Future of Purchasing and Supply (2004)
At both locations, there also exist smaller gaps within personal driving force and analytical skills. Included in analytical skills are costs and risks. Cost analysis is needed to be able to add value to the company, which will become even more important in the future, as the environment is getting more and more competitive. Risk management was in chapter 6.3 identified as important, since the vulnerability of I4’s supply chain will increase in connection with the globalisation of the company.²²²,²²³ Lack of competency within these areas can lead to rising costs and unnecessary risk exposure.

²²² Christopher M. (2005)
²²³ Norrman A. (2005-09-28)
8.2.2 Consultants

![Star diagram showing competency gaps for consultants.](image)

Figure 8.2: Competency gaps for consultants.

When analysing the star diagram in figure 8.2, it is noticeable that consultants in Lincoln are closer to the target level within all competency areas. This is natural for communication, since written and oral communication in English is part of this competency. However, communication primarily means ability to express oneself. This competency, as well as persuasive powers and giving presentations, included in management of relations, is required to present new e-procurement tools for directors and buyers and thereby contributing to an increased use of the tools. This is one of the objectives of I4 and will be important to make the operative part of procurement run more smoothly, and thereby enable buyers to concentrate on more strategic issues\(^\text{224}\). Integrated computer systems are also necessary to manage 2\(^{\text{nd}}\) and 3\(^{\text{rd}}\) tier suppliers\(^\text{225}\), which is another goal of I4 and a must in order to keep price and cost development smaller than for Siemens’ main competitors. To implement Siemens’ vendor scheduling system at more suppliers is certainly necessary to increase the service level of I4 from about 70% to more than 97%, since the tool enables suppliers to forecast their production well ahead. Lower cost development than the competitors and a raise of service level are both statements in the strategies, presented in chapter 2.3.3.

The future competitiveness of I4 and its supply chain is to a large extent dependent on consultants’ power of initiative. It is their responsibility to drive the procurement organisation in utilising procurement tools and it is therefore serious that gaps exist within personal driving force. To secure that consultants’ work can be performed successfully, the gaps within professional knowledge, which concerns costs analysis, analytical skills, teaching/pedagogy and IT usage, must also be taken care of. Again, it will be a greater

\(^\text{224}\) Gonzalez et al (2001)

\(^\text{225}\) Christopher M. (2005)
challenge for Finspong to reach the target level than it will be for Lincoln. The fact that consultants in Lincoln are closer to the target levels may be the reason why the use of the electronic order system e-Net “I” is one out of eight orders in Lincoln but only one out of twenty five orders in Finspong. However, the manager Methods/Controlling in Lincoln assumes that the reason why e-Net “I” is used more in Lincoln than in Finspong is that many of their suppliers and buyers were used to another electronic order system before the introduction of e-Net “I”.

8.2.3 Purchasing Managers
The star diagram in figure 8.3 indicates smaller gaps within most areas. This is not strange since the targets for all areas except siemens knowledge have been set to expert.

Most of the gaps are larger for the purchasing managers in Finspong than in Lincoln. This difference is natural when it comes to communication, but the difference within analytical skills, professional knowledge and management of change is harder to explain and means that it will be a larger challenge to raise the competency level in Finspong than in Lincoln. On closer examination, by means of appendix 7, one can see that the difference in analytical skills concerns cost and risk analysis but the holistic view is similar. The importance of risk analysis becomes greater with increased globalisation\(^{226}\) and the gap is remarkable considering the fact that Finspong currently has more foreign suppliers than Lincoln. However, supply chain risk management has to get greater focus at both locations.

Professional knowledge includes development of strategies, finding out solutions to arising problems, power of initiative and realisation of improvements. The purchasing manager is one of the profiles responsible for carrying I4’s goal to become world class in purchasing

into effect. To succeed in this, expert level will certainly be required and this gap has to be taken care of.

According to van Weele, superior management of change will be a key competency to enable managers to bring changes into current settings and positions. Our study indicates that changes will indeed need to be brought into I4 Procurement to achieve the required future competency level. The purchasing managers will therefore need to be experts within this competency.

Another gap is found within management of relations, where the level of competency is equal, or slightly higher, for Finspong than for Lincoln within all competencies part of this area except leadership (see appendix 7). Christopher emphasises the importance of these competencies and it was judged that purchasing managers will need expert level within management of relations. This gap may, together with the gap within management of change, obstruct the managers’ possibilities to successfully guide their personnel through upcoming challenges.

8.2.4 Senior Buyers
For senior buyers, the consequences of competency gaps are of different gravity depending on the commodities of their responsibility. This was not the case for key commodity managers since they all deal with strategic commodities. For this reason, the types of products represented at Core Engine and Packaging in Finspong and Lincoln have been investigated. This was done based on van Weele’s adaptation of Kraljic’s product portfolio. It was found that all types of products were bought, to a smaller or larger extent, with some predomination on strategic products and bottleneck products. Having this knowledge, some conclusions can be made. For example, the competencies included in management of relations is of less importance for someone working with commodities in the lower left corner (routine products) of the model, where traditional, more administrative skills are desired. Correspondingly, senior buyers acting in the upper right corner (strategic products) should be good at creating partnerships and in relationship management. Hence, the mean value for this function profile must not reach the target level for all the competency areas shown in figure 8.4.

228 Christopher M. (2005)
229 Christopher M. (1998)
230 van Weele A.J. (2005:2)
Figure 8.4: Competency gaps for senior buyers.

The star diagram indicates that the senior buyers at both locations must develop their competencies within several areas until 2010, and also that the competency level in Finspong in general is somewhat higher than in Lincoln. The explanation to some of these differences could be that Finspong to a greater extent than Lincoln focuses on employing engineers and people with higher formal education. Our study showed that all senior buyers but one in Finspong have a, for their responsibilities, relevant university degree. In Lincoln, only one of them had it. The mapped competencies may to some extent favour people with an academic background, since theoretical knowledge is needed when working strategically.

There are considerable gaps within personal driving force and analytical skills. The importance of these skills can be explained by the increased strategic role of purchasing, which according to Axelsson, leads to new tasks\textsuperscript{231}. Also, van Weele emphasises the importance of personal driving force\textsuperscript{232}, and since senior buyers within I4 Procurement are working mainly strategically, the target level has been set to expert.

\textsuperscript{231} Axelsson B. In: Silf Supply (#2 2005), p.5
\textsuperscript{232} van Weele A.J. (2005-10-18)
The gap within supply knowledge, which includes knowledge about worldwide supply markets and about culture of foreign suppliers, can cause problems when sourcing globally\textsuperscript{233}. Also, the gap within analytical skills will restrict the possibility for senior buyers to take full advantage of the global economy. In addition, senior buyers will have to ensure first-class performance by their contracted suppliers to enable buyers at Core Engine to focus on planning instead of trouble shooting. The competency gaps for senior buyers will risk obstructing their possibilities to select and maintain first-class suppliers.

\textbf{8.2.5 Buyers at Core Engine}

The competency mapping for buyers at Core Engine assumes that the organisation will be decentralised in the future (discussed in chapter 6.2.1). This scenario presumes that the preparatory work (the responsibility of senior buyers) is better performed than today. If the present problems with lack of suppliers, inferior contracts and a big expediting work load are not taken care of, the transition for the buyers will be too hard.

\begin{figure}[h]
\centering
\begin{tikzpicture}
\node[regular polygon, regular polygon sides=5, draw, minimum size=6cm, text=black] (pentagon) {
\begin{scope}[white, line width=0.3mm]
\draw (0,0) circle (2cm);
\draw[->, line width=0.3mm] (0,0) -- (90:2cm);
\end{scope}
\end{tikzpicture}
\end{figure}

\textit{Figure 8.5: Competency gaps for buyers at Core Engine.}

By studying figure 8.5 it is possible to come to two conclusions; the differences between Lincoln and Finspong are small but to Lincoln’s advantage and that the gaps in general are relatively large. The explanation to why the gaps in Lincoln are somewhat smaller may be that the tasks presently performed by buyers in Lincoln require higher competency, since their tasks are more similar to those of senior buyers.

In explanation of many of the gaps, the evaluated competencies are to a large extent not needed today. They were instead emanated from the assumptions made in chapter 6.2.1. If those assumptions become realised, especially the gaps within IT knowledge, logistics and professional knowledge will need to be taken care of. IT usage will be required to facilitate

\textsuperscript{233} Snijders C. and Tazelaar F. (2003)
the buyers’ operative tasks, so that they can focus on planning and finding excellent logistic solutions. The explanation to the present gap within IT is partly that IT tools are used to a very limited extent today and the competency level will naturally develop as the usage increases as a result of the IT trend. Competencies within logistics involve a holistic view and the ability to analyse the impact of different decisions on total cost. This is crucial in order to derive advantage from the possibility to adapt purchases according to different currency rates, distances, risks in different markets etc. For this reason, the competency gaps within logistics will have to be taken care of.

Professional knowledge concerns ability to work according to defined processes, personal driving force, planning with respect to changing conditions and exchange rate management. With the exception of ability to work according to defined processes, which Lincoln has reached the target level for already, gaps exist within all of these competencies. Exchange rate management and to improve processes and thereby increase productivity are two of those prerequisites identified by I4 Procurement to become world class in purchasing. Gaps within these competencies should therefore not exist. To serve the purpose with a decentralised organisation, buyers must have a strong personal driving force and ability to respond to changing conditions. Competency gaps within these areas are therefore serious and new recruitments or competency development of existing staff is required. Since all buyers were found to be positive towards competency development and stated that they always or usually find it easy to learn new things and develop their skills, competency development should be possible.

The gap within internal and external co-operation is large but probably depends mainly on the fact that most buyers do not have any experience within this area. Moreover all buyers at both locations are positive towards regular communication with suppliers and this indicates that there are good possibilities to fill this gap.

8.2.6 Buyers at Packaging

These buyers will have the same responsibilities as senior buyers, but for less important or less complex commodities. The consequences of competency gaps are therefore similar to those described when analysing the consequences for senior buyers. However, the consequences for the company as a whole are not as severe as when handling purchases with high total spend or strategic importance, and this is the reason why the target levels for most of the competency areas in figure 8.6 have been set a little lower than for senior buyers. Quite naturally, the current competency level is also lower for buyers at Packaging than it was for senior buyers. Nevertheless, considerable gaps which need to be taken care of exist.

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234 Gonzalez et al (2001)
Figure 8.6: Competency gaps for buyers at Packaging.

The buyers must increase their supply knowledge, including knowledge about worldwide supply markets, market analysis and about culture of foreign suppliers. As mentioned when analysing senior buyers, these skills will become increasingly important as a result of the ongoing globalisation\textsuperscript{235}. The gap within professional knowledge is also considerable. This mainly concerns total quality management and different materials’ and processes’ impact on the environment. If competency gaps exist within quality, it will be hard for buyers to insist on needed quality when contracting suppliers. This in its turn may spoil the possibility for I4 Procurement to decrease NCC cost by securing quality assurance at suppliers. Low competency level within environmentally sound processes is also serious, since this might frustrate I4’s goal to become the good example in social responsibility.

Increased usage of IT tools will diminish the gap within this area and allow the buyers at Packaging to focus more on strategic work\textsuperscript{236}. Further, the gap within management of relations needs to be filled, since these qualities will become more important as the function profile develops towards more strategic responsibilities\textsuperscript{237}. They will have to manage supplier relations as well as relations within internal cross-functional teams. A noticeable aspect with the gap analysis is that the differences between the two locations are small and about the same efforts will be needed to achieve the target level in Finspong and in Lincoln.

\textsuperscript{235} Snijders C. and Tazelaar C. (2003)
\textsuperscript{236} Gonzalez et al (2001)
\textsuperscript{237} Axelsson B. In: Silf Supply (#2 2005), p. 5
8.2.7 Supplier Development Engineers

As seen in figure 8.7 above, supplier development engineers in both Finspong and Lincoln have a large gap when it comes to personal driving force, even larger for Finspong than for Lincoln. Personal driving force is one of those qualities which will be desired by all personnel within procurement as their environment becomes more complex and the role of procurement is getting more and more strategic. To make other departments accept this increased importance of procurement and rely on purchasers’ competency, they must become more professional. According to van Weele, personal driving force is an important enabler of purchasing professionalism. Personal driving force will be particularly important for supplier development engineers, in order to ensure that development projects to improve the technical results of suppliers will be run. Better technologies will make the production more effective and decrease the risks for failures and poor quality. This, in its turn, will enable I4 to reach its target to reduce NCC cost of 75% and make its supply chain more competitive.

Also the level of professional knowledge is lower than considered necessary beyond 2010. For supplier development engineers, professional knowledge includes knowledge within total quality management, cost analysis, environmentally sound process technologies and different materials’ and processes’ effects on the environment. Lacking skills within total quality management and cost analysis makes it hard for the supplier development engineer to judge if a development project is worth the investments and to compare different

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238 van Weele A.J. (2005-10-18)
239 Ibid.
methods to improve the suppliers’ result. In addition, the complexity when improving suppliers’ quality increases with the distance to the suppliers. This makes the consequences of the gap even more serious, because I4 Procurement intends to increase global sourcing. However, the company is aware of the importance of quality and has therefore recently installed a new employee having the overall quality responsibility within procurement.

The impact of companies on the natural environment will, according to Axelsson, be a heated discussion in the future\(^{240}\). To make I4 Procurement contribute to the competitive advantage of I4, supplier development engineers have an important responsibility to ensure that suppliers have environmentally sound processes and technologies. A gap within this competency area might frustrate the possibilities for Siemens to be the good example regarding social responsibility.

Within all mapped competency areas, the level of competency is notably lower for supplier development engineers in Finspong than in Lincoln. This means that it will be a larger challenge to reach the required competency level in Finspong than in Lincoln. The explanation to Finspong’s larger gaps within Siemens knowledge and supplier knowledge is probably that the supplier development engineers in Finspong have been employed recently, and are less experienced than those in Lincoln. Less experience partly explains their larger gaps within professional knowledge and management of relations as well.

**8.3 Comparison between Finspong and Lincoln**

Table 8.2 from chapter 7.2.3 summarises what roles are connected to what function profiles.

*Table 8.2: Connection of roles to existing function profiles.*

<table>
<thead>
<tr>
<th>Role</th>
<th>I4 function profile</th>
<th>Key commodity manager</th>
<th>Consultant</th>
<th>Purchasing manager</th>
<th>Senior buyer</th>
<th>Buyer Core</th>
<th>Buyer Pack.</th>
<th>Supplier development engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definer of specification</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Selector of supplier</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>The contracting role</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Order releaser/Expediter</td>
<td></td>
<td></td>
<td></td>
<td>X*</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supplier developer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Purchasing manager</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Project manager</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Relationship manager</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Risk manager</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Order facilitator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

*only applicable for senior buyers at Packaging

Based on this table, the results from the gap analysis are summed up in figure 8.8, by showing a star diagram containing all roles. The separation between Finspong and Lincoln shows how developed the different roles are at each location. There is no target level

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\(^{240}\) Axelsson B. (2005-09-30)
indicated for the roles, since the target levels were set for specific function profiles, whereas this star diagram shows the average competency level calculated for all profiles. In the star diagram in figure 8.8, the overall competency requirements are also included.

![Star Diagram](image)

**Figure 8.8: Average competency level within overall requirements and roles, calculated for all profiles in Finspong and Lincoln respectively.**

What is notable with this diagram is how small the differences between the two locations are for most roles. Although differences were found when comparing function profiles’ level of competency in Lincoln and Finspong, the total level of competency for each location seems to be about the same when aggregating the results for all profiles. The only considerable differences concern the roles as supplier developer and order facilitator. The latter is possessed by consultants only. For these function profiles, the competency level is higher in Lincoln than in Finspong and this explains Lincoln’s advantage concerning the role as order facilitator.

The gap for the role as supplier developer can to a large part be explained by experience and different ways of working. It should be remembered that the supplier development engineers in Finspong have been employed recently, whereas some of them in Lincoln are very experienced. The explanations to the differences are further discussed in chapter 8.2.7.

### 8.4 Development of Competencies and Roles

In this section, the theories about competency development, brought up in the frame of reference, are discussed considering the specific conditions of I4 Procurement. However, one thing that has to be clarified before discussing different approaches to competency development programs is that competency development has to be done taking the
individual as a starting point. This is not possible in this study because of the directive that competency gaps shall not be demonstrated on an individual level. Because of this, it is only possible to give general suggestions about competency development and different parts of this study are therefore in conflict. If competency mapping is instead done on an individual level, the competencies in need of development for every employee can be placed in one of the fields in the system of co-ordinates shown in figure 8.9. This is a useful tool for many situations where decisions have to be made, and it is brought up in numerous different situations in the literature. An adaptation has been made in order to suit the context of competency development. Based on this model, it is possible to decide what competencies are in need of development, taking both the required consumption of resources and the expected impact on the final result into consideration. All the competencies found in square 1 are easy and cheap to develop and have a significant impact on the final result and should therefore be developed. For competencies placed in the other squares, a more careful analysis of the pros and cons should be conducted. The placing of different competencies depends on the individual in question, the tasks and responsibilities and the strategic importance of the function profile.

![Figure 8.9: Based on both the required consumption of resources and the expected impact on the final result, it is possible to decide and prioritise what competencies to develop.](image)

### 8.4.1 Development of Specific Competencies

In this section, it will be discussed how some of the competencies where gaps exist can be developed.

The fact that the supplier development engineers in Finspong are working in close co-operation with those in Lincoln to learn from them is good, and this is a desirable way to develop competencies for other function profiles too. However, some competencies

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241 Eklund G. (1986)
brought up in this study, e.g. personal driving force, more have the nature of personal qualities and are part of the personality. These are hard to improve through competency development and to recruit new employees might be a better solution in those cases.242

On-the-job-training, a method described by Axelsson, is one way for individuals to get increased understanding for other departments. On-the-job-training could, for example, include spending periods of time in other departments for practice.243 If buyers and senior buyers at I4 were allowed to do this, the understanding for other functions and the holistic view would most certainly improve. This kind of rotation could improve the customer focus as well, which is sometimes a weakness among the procurement staff. Shifting between procurement and the sales department would increase the customer understanding. Another way to increase the understanding for other departments is simply to communicate more with each other by, for example, having additional regular meetings. In this context, however, the time factor can not be neglected; if there is a big workload within the own department, this communication will naturally suffer.

Communication skills have been found to be very important for most profiles within procurement. Oral skills can be improved through mentoring, coaching and training.244

Language
For all function profiles, the language proficiency when it comes to other languages than English has been examined by means of questionnaires. The study showed that the competency level within additional languages is very low at both locations, but somewhat higher in Finspong than in Lincoln. English, being the international business language, is of course the most important, but as a result of the increased globalisation, skills within other languages will more and more become an asset. It indicates that the person has the ability to work on an international field and has an understanding for other cultures. It is hard to say what specific foreign languages will be the most relevant in the long term future since this depends on the development in emerging regions. A good guess though is that skills within, for example, Russian and other languages from the Far East, will be attractive in the future. Languages from these regions are also brought up as interesting by the purchasing director at I4. One of the senior buyers states that speaking the language of the suppliers you are involved with really facilitates the co-operation.

The personnel in Lincoln are obviously better in English and most of their suppliers are local. Because of this they seldom experience language difficulties, not even much when dealing with suppliers abroad, since English is the international business language. For this reason they might not bother much to learn about other cultures or additional languages. They should keep in mind that even though they do not experience any language difficulties, the other party may certainly do so, since the skills in English are not very developed in all

243 Ibid.
244 Large R.O. and Giménez C. (2004)
parts of the world.

8.4.2 Roles in Need of Development

Our study of I4 procurement indicates that they have a well developed organisation containing most profiles that will be required in the future. However, the increased globalisation and the general tendency towards supplier base reduction, create more vulnerable supply chains, leading to greater risks for the company. The theories therefore suggest that there will be a need for some sort of supply chain risk management (SCRM) team. SCRM means understanding and trying to avoid effects that disasters or minor business disruptions can have in a supply chain. This is done by applying risk management process tools in collaboration with partners in the whole supply chain. It is thus not enough to manage risks within the own company. The following process (earlier described in chapter 3.3.4) may provide a structured way of working with risk issues.

![Risk Management Process](image)

Figure 8.10: The risk management process.  

Today, the risk management responsibility more or less belongs to everyone. When workload is high it is easy to imagine that the risk assessments before every decision sometimes suffer. When needed, however, a temporary team is formed, for example when a new supplier shall be evaluated. Risk factors are also taken into consideration during the yearly evaluation of existing suppliers. During this evaluation, risks further upstream in the supply are supposed to be considered, but during our study it was revealed that this is not always done properly. This is in contrast to the strategy of I4 Procurement, which states that to mitigate risks in the supplier network is needed to become world class in purchasing. Putting requirements on SCRM into the contracts with the suppliers of I4 should also increase the possibilities for suppliers to contribute to a service level to I4’s customers of more than 97%.

A permanent risk management team within the procurement organisation would put greater focus on risk factors and could inform and educate other function profiles in how to handle different risks. This team should be educated in risk management and be updated on changes in the supply markets that may affect the company and the whole supply chain. This information should regularly be spread to buyers so that they know where it is safe to do business. Getting this information from the risk management team would reduce the need for the buyer to spend time on market- and risk analysis. To reduce the risk exposure further, it should be required of strategic suppliers as well to work with supply chain risk management in a structured way.

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245 Christopher M. (2005)
9 Recommendations

In this chapter, the most important points from the analysis are brought up and based on this; recommendations concerning what competencies need to be developed are formulated. General suggestions about how to achieve required competencies are also given.

9.1 Competencies in Need of Development

Below, the specific gaps for the different function profiles are discussed. Based on the consequences for I4, it is concluded what competencies need to be developed primarily. In a longer term, however, it should be strived for filling all the gaps indicated in the star diagrams.

9.1.1 Key Commodity Managers

This function profile is responsible for the strategic parts of the purchasing process for key commodities. As part of the supply management organisation IBS, this function profile has a significant impact on the possibilities for procurement to find synergies, and hence to decrease costs and increase the competitiveness of Siemens PGI. To find synergies requires a lot of co-operation within the GZs, and the key commodity manager often acts like a project manager. In addition, this function profile is involved in other strategic projects, both within procurement and other departments. The fact that there is a competency gap within management of relations will therefore need to be taken care of.

➢ Develop competency level within management of relations

Except insufficient competency level within management of relations, key commodity managers seem to be fairly well prepared for the future. However, the gravity of the smaller gaps, for instance communication and personal driving force, should not be underestimated. The development of these competencies may as well have a positive impact on management of relations.

9.1.2 Consultants

When analysing the competency gaps, it came to light that consultants in Lincoln have a fair chance to contribute to an increased use of e-tools and thereby to contribute to the future competitiveness of I4. Only few and small gaps exist and these can not be considered as those competencies which need to be developed primarily within I4 Procurement.

In contrast, consultants in Finspong have considerable gaps within communication, management of relations, professional knowledge and personal driving force. Low power of initiative and capability to express oneself, as well as incapability to teach buyers how to use tools will be a severe lack as this may spoil the possibilities to increase the use of e-procurement tools. I4 Procurement in Finspong should therefore develop the competencies where gaps exist.
- Develop competency level within communication
- Develop competency level within management of relations
- Develop competency level within professional knowledge
- Develop personal driving force

9.1.3 Purchasing Managers

The gap analyses indicated that in order to tackle future requirements, the competency level will have to increase for many of the studied function profiles. Purchasing managers are responsible for development and recruitment of staff, and their competencies therefore influence the possibilities of I4 Procurement to achieve the desired competency level. Purchasing managers’ competency gaps will therefore need to be taken care of. The recommendations below concern the largest gaps, which primarily need focus.

- Develop competency level within analytical skills
- Develop competency level within professional knowledge
- Develop competency level within management of change
- Develop competency level within management of relations

When interviewing purchasing managers, it came to light that a holistic view is lacking among most of the staff today. They need to fully understand their position in the company and how their decisions affect other departments and the company as a whole. An increased holistic view would be appreciated by Service (I1) and by Oil & Gas (I6), since these GZs feel that I4 Procurement does not always show an understanding of their needs. During interviews with purchasing managers, it also came to light that the demands on technical knowledge and on formal education are lower in Lincoln than in Finspong. On the other hand, more of the employees in Lincoln have for their responsibilities relevant professional experience. Even though experience is valuable, higher education will be more and more necessary as the strategic role of purchasing increases. As the products of Siemens Industrial Turbomachinery are technical and complex, better technical knowledge among the personnel within I4 Procurement would improve their possibilities to co-operate with suppliers and the design function, during for example defining of specifications.

- Emphasise the importance of a holistic view and technical knowledge among the personnel

In the gap analysis it was argued that some of the function profiles do not have sufficient knowledge about environmentally sound processes, and that this might spoil the possibilities for Siemens to be the good example regarding social responsibility. As a result of the globalisation, sourcing from emerging regions is likely to increase. This will make CSR issues more important and the managers should inform the staff about what is

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249 The Global CPO Survey (2005)
important for different regions and perhaps work out new processes on how to evaluate suppliers on CSR aspects. To be able to do this, they need to keep themselves updated on changing CSR demands from different stakeholders. These demands, as well as requirements on new roles, should be identified on a regular basis. This is further discussed in chapter 9.2.3.

- Keep themselves updated on changing CSR demands from stakeholders and inform the staff about new aspects they have to consider

Finally, when discussing which function profiles need to assume the role as risk manager in chapter 7.2.2, it was concluded that risks are often assessed for first tier suppliers only. This will not be enough in the future, since supplier reduction and global and complex networks potentially lead to greater risk exposure. Risks have to be managed and mitigated in the whole supply chain. As it is the purchasing managers’ responsibility to lead forward the strategic work of their department and identify improvement areas, they should encourage the staff to take more risk aspects into consideration and to look further back in the supply chain than just to its own suppliers.

- Encourage the staff to take more risk aspects into consideration during supplier evaluations

9.1.4 Senior Buyers

The gap analysis indicated that to be able to cope with the ongoing globalisation and to master existing problems with lack of suppliers, senior buyers will have to raise their knowledge within worldwide supply markets and about culture of foreign suppliers. Furthermore, in consequence of their strategic role, higher competency level will be required within personal driving force and analytical skills. The fact that these gaps are large, even larger for senior buyers in Lincoln than in Finspong, implies that great resources will be needed to achieve the target levels. In addition, gaps exist within all other competencies too, except end product knowledge in Finspong. These gaps should not be neglected but the following actions need to be taken primarily:

- Increase knowledge about worldwide supply markets and culture of foreign suppliers
- Raise competency level within personal driving force and analytical skills

One reason why senior buyers in Finspong have higher competency level than those in Lincoln may be different requirements on education. A university degree is seldom required for positions in Lincoln. They prefer, however, a commercial education, whereas a more technical education is preferred in Finspong. Different competency levels within end

250 Christopher M. (2005)
product knowledge, commodity knowledge and IT knowledge can be explained by higher requirements on technical education in Finspong than in Lincoln. I4 Procurement in Lincoln should therefore increase the demands on relevant education.

- **Raise the requirements on technical and commercial education in Lincoln**

### 9.1.5 Buyers at Core Engine

The gap analysis showed that most competencies required by buyers beyond 2010 are in need of development. In addition, this function profile will undergo considerable changes if the decentralisation described in chapter 6.2.1 becomes realised. A lot of effort will therefore be needed to raise their level of competency and ensure that all buyers agree with the organisational changes. Because of the severe consequences of gaps within logistics, professional knowledge and IT knowledge, I4 Procurement should develop these competencies primarily. However, the ability to work according to processes does not need to be developed in Lincoln.

- **Raise competency level within logistics**
- **Raise competency level within IT knowledge**
- **Develop all competencies within professional knowledge, except for ability to work according to processes in Lincoln**

### 9.1.6 Buyers at Packaging

According to the gap analysis, buyers at Packaging in both Finspong and Lincoln will be confronted with about the same needs of competency development. To fill the gaps within supply knowledge, professional knowledge and management of relations is of particular importance, since these gaps are large and will have serious consequences for the buyers’ possibilities to handle their tasks and responsibilities successfully. The following recommendations are therefore given:

- **Raise competency level within supply knowledge**
- **Raise competency level within professional knowledge**
- **Raise competency level within management of relations**

### 9.1.7 Supplier Development Engineers

The gap within personal driving force is considerably large for supplier development engineers in both Finspong and Lincoln. In chapter 8.2.7 it was argued that supplier development engineers’ personal driving force has a high impact on the technical results of the suppliers, and hence on the possibilities for I4 Procurement to mitigate risks and reduce costs in the whole supply chain. Personal driving force is therefore one of the competencies which supplier development engineers should develop primarily.

- **Develop personal driving force**
As discussed in the analysis, lacking skills within total quality management and cost analysis makes it hard for the supplier development engineer to compare the efficiency of different ways to improve the suppliers’ result. This is an important task for this function profile and the following recommendation is therefore given:

- **Develop competency level within total quality management and cost analysis**

Today’s low competency level within environmentally sound process technologies and different materials’ and processes’ effects on the environment may frustrate the possibilities for Siemens to be the good example regarding social responsibility. These competencies will therefore need to be developed.

- **Develop knowledge within environmentally sound process technologies and different materials’ and processes’ effects on the environment**

The analysis indicated that the competency level within all competency areas is lower for the supplier development engineers in Lincoln than for those in Finspong. Their knowledge about suppliers and about Siemens will probably increase in time. So will their competency level within management of relations, as practise gives experience. This is an area of competency where a gap exists for those in Finspong, whereas those in Lincoln have achieved even higher competency level than required. It is therefore positive that the engineers in Finspong aim to learn from those in Lincoln. However, before the competency level in Finspong has increased it will be challenging for the supplier development engineers to manage development projects. The following recommendation is therefore given in order to urge on the process.

- **Raise competency level within management of relations in Finspong**
- **Make sure that the knowledge sharing from Lincoln to Finspong is performed in a structured way, and that resources are given to the supplier development engineers in Lincoln to make them feel comfortable with sharing their knowledge with those in Finspong**

### 9.2 Ways to Develop Competencies and Roles

Some recommendations concerning development of competencies and roles will now be provided. The chapter concludes in a model describing how competencies can be kept up to date within the company.

#### 9.2.1 Competency Development

In chapter 8.4, general guidelines concerning competency development were addressed. It was also discussed how some of the competencies where gaps exist can be developed and some recommendations on this subject will now be provided. However, when planning competency development programs, a far more extensive analysis will be needed.
If the purpose of a competency mapping is to develop the staff, the mapping has to be made on an individual level. When assessing what competencies to develop first, the matrix presented in figure 8.9 is a useful tool.

- **Make use of the system of co-ordinates, presented in figure 8.9, when deciding what competencies to develop**

Further, the managers should encourage job-rotation among their staff, in order to increase understanding for other departments and get a better holistic view.

For the competencies where there is a significant difference between Finspong and Lincoln, the staff on the less developed location can learn from the others, through on-the-job-training. This would include spending periods of time on the other location for practice.

- **The management should encourage job-rotation and provide possibilities for on-the-job-training.**

### 9.2.2 Development of Roles

In chapter 8.4.2 it was argued that supply chain risk management will need to get greater focus in the future. Today, this responsibility more or less belongs to everyone. A specific team having this responsibility would put greater focus on risk issues. A recommendation to I4 Procurement is therefore to form a permanent supply chain risk management team out of existing function profiles. If this is done, however, some of today’s workload has to be lifted to provide time for risk management.

- **Install a supply chain risk management team**

### 9.2.3 A Continuous Evaluation Model

A gap analysis shows what competencies are missing at the moment. As the requirements on the procurement organisation are changing with new macroeconomic trends, the impact of trends will need to be analysed continuously. To enable I4 Procurement to contribute to the competitive advantage of I4, new ways to make purchasing more efficient and effective must always be strived for. According to Christopher, the rate of external changes should not be higher than the rate of changes in the internal environment. To make a business successful, it is important that the organisation has developed competencies that are appropriate to the changes.\(^{252}\) This means that people within procurement have to be able to work in a constantly changing environment, requiring a very flexible attitude.\(^{253}\)

Because of new possibilities and requirements, new competencies will be needed and a gap

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\(^{252}\) Christopher M. (1998)

\(^{253}\) Humphreys et al (1998)
analysis, like the one carried out within the framework of this thesis, will need to be repeated with regular intervals. I4 Procurement should therefore regularly review its organisation according to the model in figure 9.1. This continuous evaluation model has been composed based on the different steps of this thesis, and below it is explained in more detail.

**Figure 9.1:** By following this model the competencies within I4 Procurement will be up to date.

Step 1 is to study ongoing macroeconomic trends and to conclude what impact they will have on procurement in the future. This particular thesis looks at 2010 and beyond and that may be an appropriate time frame to stand by. From the examination of trends it can be stated what the future requirements on procurement will be in terms of competencies and crucial roles. That is step 2 in the model.

Step 3 involves competency mapping of the staff and a gap analysis. In this thesis, the results of the gap analysis were used on an aggregated level. To be able to design competency development programs, it is better to analyse the results on an individual level,
not on an aggregated level. In order to develop competencies, it is necessary to consider the individual’s specific qualities and preconditions, like ability and readiness to accumulate human capital\textsuperscript{254}. However, a functional competency assessment, like the one made in chapter 8.3, should also be performed to make sure that the competencies within the whole function are right and that necessary roles exist. If serious competency gaps are identified during the analysis, one should move on to step 4. On the other hand, if it is shown after the gap analysis that no serious competency gaps exist, step 4 can be left out.

Step 4 deals with deciding whether to develop competencies among the present staff or if new personnel should be recruited in order to acquire the needed competencies. When deciding what competencies to develop, one can make use of the system of co-ordinates presented in chapter 8.4. The pros and cons of competency development programs, as well as the costs connected to new recruitments, have to be carefully analysed. Finally, with reasonable intervals, it is time to start over again from step 1 and investigate what new macroeconomic trends will have an impact on procurement.

In chapter 2.3.4 it was described how I4 currently runs a project where they are mapping competency requirements and areas of responsibility for core roles within the core functions of I4. That project will become a continuous updating process of job profiles, and in this process the model presented in this chapter can constitute a complement. In that way, competency requirements emanating from ongoing trends would be formally included. Today, the project is based upon thoughts and opinions of different managers within I4 only.

➢ \textit{I4 Procurement should regularly review its organisation according to the continuous evaluation model presented in figure 9.1}

\textsuperscript{254} Eklund G. (1986)
10 Conclusions

In this chapter, the purpose of the thesis and the directives are discussed. Furthermore, some comments concerning the general applicability and criticism of the study are brought up. Finally, there is a discussion concerning future research areas of interest.

10.1 Primary Results

The purpose of this thesis was to analyse long term future requirements on procurement at Siemens PGI4, in terms of competencies and crucial roles, in order to make procurement contribute to competitive advantage. The future requirements should be based on ongoing macroeconomic trends, trends within procurement and the specific conditions for Siemens PGI4.

After thorough studies of literature and articles, and interviews with professor van Weele and professor Axelsson, the most known purchasing professors in Europe and Sweden respectively, it was decided what macroeconomic trends the study should be based on. Further, the specific conditions for I4 were taken into consideration during the identification of future crucial roles and competencies that arise from the impact of the studied trends. Based on a mapping of current function profiles, it was determined what will be required by each function profile in the future.

According to the directives, the study should include I4 in both Finspong and Lincoln, and a gap analysis should be performed. In chapter 8.2, a gap analysis involving all function profiles included in the studied system of this thesis was carried out. The levels in Finspong and Lincoln were compared and the differences were analysed. All gaps found when comparing current competency level and future required level were not large. Within some competency areas, the current level is even higher than considered as needed beyond 2010 and altogether it must be concluded that the procurement organisation in both Finspong and Lincoln have good possibilities to fulfil the future competency requirements. The sooner the required competency levels are achieved, the better, since the right competencies are needed to add value and thereby be able to contribute to the competitiveness of I4. If this study had been made before focus was put on procurement in connection with the acquisition by Siemens in 2003, the gaps would probably have been larger. According to the personnel manager at I4, the increased level of competency is mainly a result of new recruitment and not so much a result of competency development. Since I4 Procurement became recognised as a strategically important function, the requirements on ability to build relations and analytical skills have increased on those recruited. However, this study shows that there still exist some competency gaps within these areas.

The explanation to the gaps often lies within the history of the procurement function. Until recently, it was a passive function, out of focus and not considered to be very important within the company.255 Also, it is not surprising that some gaps exist, since the focus has

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been set on the future requirements, not on what is required today. To raise the competency in order to cope with the future requirements will still take some effort. As new requirements appear as a result of new trends, we recommend I4 Procurement to do gap analysis at regular intervals, as described in the continuous evaluation model presented in chapter 9.2.3.

Many of the strategies of I4 Procurement (described in chapter 2.3.3) turned out to be in line with the studied trends. This shows that the management of I4 Procurement is well aware of future requirements. Hopefully this thesis has made managers even more aware of supply chain risk management, so that the increased risk exposure will not cause disasters for I4 in the future.

10.2 General Applicability
The purpose of this thesis was to examine the future requirements on procurement as a result of ongoing macroeconomic trends. This was done on a very general level and many of the competencies identified in the frame of reference are therefore relevant for any procurement organisation. Particularly the impact of the globalisation is something that can not be neglected by any company, as the competition grows stiffer and new threats and opportunities arise.

The continuous evaluation model described in chapter 9.2.3 is applicable for all organisations, not only procurement and not only I4. Competency development is an important subject for all business functions within all lines of businesses. We therefore consider the general applicability of this model to be high.

When we searched for theories for the frame of reference, we discovered that there was a very limited amount of literature actually connecting macroeconomic trends to competency requirements on procurement. In this thesis, that connection was done in chapter 6.3 when roles were identified. The theoretical contribution of this thesis should therefore be valuable, at least for the time that the trends brought up stays relevant.

10.3 Criticism/Limitations of the Report
The target levels for different competencies depend on what impact the studied trends will have on procurement in the future. We have assumed that the trends described in the frame of reference are the most relevant and that all of them will have a significant impact on I4. However, if the impact of certain trends is shown to be smaller than anticipated, the target levels are in some cases put to high.

Since the focus of this study is on competencies required as a result of ongoing macroeconomic trends, competencies not affected by these trends have not been addressed. For this reason, some competencies that are important today and that will so continue are not mapped. For example, one competency that is very central for both senior buyers and key commodity managers is negotiation skills. This will continue to be one of the most
significant competency areas for these function profiles, but it is not getting increasingly important as a result of any of the studied trends.

Another important issue that should be commented on is that our study sometimes appears to indicate that all employees must be highly educated university graduates. This is argued based on theories and trends, but one should keep in mind that there has to be a mixture of people with different backgrounds in any department; young graduates and more experienced employees has to complement each other.

10.4 Further Research Areas
The focus of this study is on future competency requirements as a result of macroeconomic trends. However, indications on some additional future requirements that are not clearly connected to competencies have appeared during the study. These requirements are also a result of the trends and will be important for I4 Procurement in the future. These issues are now briefly presented and discussed.

The Drawbacks of Outsourcing
Earlier in this thesis the possibilities of the globalisation and of increased outsourcing to other parts of the world has been discussed. Some comments should therefore be made concerning the challenges and drawbacks of outsourcing business activities to, for example, the Far East. Many companies in this region experience problems such as disloyalty, defections and theft of ideas. The poor loyalty leads to much movement of employees on the market and to difficulties with recruiting and keeping skilled people. Before a large scale movement to these regions, a careful market research and analysis have to be carried out. The analysis should involve risk assessment, which is particular important before outsourcing overseas.\(^{256}\) Examples of risks to take into consideration are the stability of currency and legal system in the region in question and government and social stability\(^{257}\).

The Need of International Purchasing Offices
According to Axelsson et al, international purchasing offices will become an important part of the organisational structure as companies shift towards global sourcing.\(^{258}\) I4 intends to use Siemens’ global purchasing network, but this may not always be possible. The requirements on infrastructure for global sourcing need to be studied further. If I4 should open their own offices on new markets, they should, for example, keep in mind the potential difficulties of recruiting and keeping skilled people\(^{259}\).

Organisational Development
The assumptions made in chapter 6.2 would be interesting to investigate further. These are based on discussions with a few managers and are not preceded by a throughout analysis.

\(^{256}\) Friedlander J. (2005)
\(^{258}\) Axelsson et al (2005)
\(^{259}\) Friedlander J. (2005)
The assumptions concerned future organisational development, an issue interesting to study for any company, not only I4.

Requirements on Top Management
Finally, we would like to make some comments concerning two function profiles; director supply management and purchasing director. Even though the current competency level of these profiles have not been mapped (discussed in chapter 4.1), the requirements on them should not be neglected. According to Axelsson and van Weele, personnel working at a high level within purchasing organisations will be very much affected by the trends described in the frame of reference. We would once again like to emphasise some of these issues. According to van Weele, superior management of change is a key competency and leadership and power of initiative is required by chief procurement officers. They have to act on their vision and be able to bring changes into current settings and positions, which will not always be popular among co-workers. This is necessary if the company shall remain competitive.\textsuperscript{260}

\textsuperscript{260} van Weele A.J. (2005-10-18)
11 References

11.1 Published Books

Axelsson B. et al (2005), *Developing Sourcing Capabilities*, John Wiley & Sons Ltd, England


Berggren et al (2005), *Alternativ till outsourcing*, Daleke Grafiska AB, Malmö


Christopher M (2005), *Logistics and Supply Chain Management*, Pearson Education Limited (printed by Biddles Ltd), Great Britain

Eklund G. (1986), *Utveckling pågår*, Norrprint AB, Bureå


Gadde L.E. and Håkansson H. (2001), *Supply Network Strategies*, John Wiley & Sons Ltd, United Kingdom


Monczka et al (2000), *Purchasing and Supply Chain Management*, 2nd edition, South-Western, a division of Thomson Learning, USA


11.2 Published Articles


Humphreys et al (1998), *The purchasing function as a professional service firm: implications for training and development*, Journal of European Industrial Training, Volume 22, Issue 1, pp. 3-11


Snijders C. and Tazelaar F. (2003), *Trust and cultural differences in international purchasing and supply*, IPSERA 2003

**11.3 Oral Sources**
Axelsson B. (2005-09-30), tenured professor at Stockholm School of Economics (SSE) and occupant of the Silf Chair of Purchasing and Supply Management at the school

Prof. Dr. Van Weele A.J. (2005-10-18), holder of the NEVI-Chair in Purchasing and Supply Chain Management at Eindhoven University of Technology

Waernborg J. (2006-11-04), responsible for purchasing educations at Silf Competence AB

**11.4 Internet Sources**
Nationalencyclopedins Internettjänst, 2005-09-12
http://www.ne.se/jsp/search/search.jsp?h_search_mode=simple&h_advanced_search=false&t_word=globalisering&btn_search=S%F6k+i+NE

Procuri’s Marketing Library, 2005-10-31

Silf Supply, 2005-09-23

Powernet, 2006-01-24
www.powernet.co.uk/client/general/glossary.shtml

**11.5 Others**
Norrman A. (2005-09-28), lecture at Linköping University


Appendix 1: Siemens PGI Definitions

**GZ** – At Siemens PGI, GZ stands for sub-division. The sub-divisions of PGI are I1, I2, I3, I4, I5 and I6.

**IBP** – The decentralised purchasing organisation which is mainly responsible for operative purchasing activities. IBP is also responsible for the strategic steps in the purchasing process when the purchase concerns non-strategic commodities.

**IBS** – The central supply management organisation which is responsible for the strategic purchasing process, tools and methods for purchasing.

**Key commodity** – A category of purchased items that are considered to be strategically important for Siemens PGI, for example due to total spend volumes and market complexity.

**NCC** – Non Conforming Costs. These costs arise as a result of inferior quality in products or processes.

**Procurement** – At Siemens PGI, this expression includes both supply management (IBS) and purchasing activities (IBP).
Appendix 2: Questionnaire Survey

The number of replies and the frequency for each function profile included in our questionnaire study.

<table>
<thead>
<tr>
<th>Function profile</th>
<th>Number of answers</th>
<th>Percentage of answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key commodity manager</td>
<td>6</td>
<td>86%</td>
</tr>
<tr>
<td>Consultant</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Purchasing manager</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Senior buyer</td>
<td>14</td>
<td>70%</td>
</tr>
<tr>
<td>Buyer at Core Engine</td>
<td>12</td>
<td>60%</td>
</tr>
<tr>
<td>Buyer at Packaging</td>
<td>8</td>
<td>73%</td>
</tr>
<tr>
<td>Supplier development engineer</td>
<td>7</td>
<td>88%</td>
</tr>
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</table>

Totally 56 answers.
Appendix 3: Cover Letter for Senior Buyers

Dear Senior Buyer,

We are two students from Linköping University in Sweden, writing our Master’s thesis for Siemens PGI4 in Finspong. Micael Hedlund is the sponsor of the thesis and Kristofer Forsmar is our tutor.

The purpose of the thesis is to analyse the impact of macroeconomic trends on Procurement. We are studying what competencies will be required in 2010 by personnel within Procurement at PGI4 in Lincoln and Finspong, as a result of this impact. Furthermore, Micael Hedlund has asked us to evaluate the gap between current competency and future competency requirements. According to our study Senior Buyer will be one of the most important roles in the future. We would therefore very much appreciate if You, as a Senior Buyer, could take Your time to answer the questions accurately. Including instructions, we estimate that it will take about 15 minutes to fill in the questionnaire. Your participation is essential to ensure the future competitiveness of Siemens PGI4. The answers will be treated completely anonymously.

Please answer all questions by putting a cross in one of the statements. The answer shall be based on how You estimate Your current level of competency, not on how You think others may interpret You or on how You wish others to interpret You. Then save the changes of the document and send it to us by email. We can’t avoid seeing who has sent us the answers, but we guarantee that the answers of individuals won’t be brought to anyone’s knowledge. When You have sent us Your answers we will put them together with the answers of the other Senior Buyers.

In case of questions concerning the questionnaire or the study, please don’t hesitate to call or email us, phone +46 122 87241, +46 73 7028348 or +46 70 2669402. Email josefine.marklund@pg.siemens.com, fredrik.handberg@pg.siemens.com

Please send us the filled in questionnaire before Friday November 25th, don’t forget to save the changes before attaching the questionnaire!
Appendix 4: Interview Sources at Siemens.

Andersson K. Manager Methods/Controlling, Finspong
Baskcomb T. Procurement Co-ordinator I6, Lincoln
Bower N. Manager Methods/Controlling, Lincoln
Clark I. Purchasing Manager I1, Lincoln
Eriksson O. Senior Buyer, Finspong
Forsmar K. Senior Buyer Siemens PGI4
Gilenmyr P. Purchasing Manager Core Engine, Finspong
Granlund A. Consultant, Finspong
Greek J-O. Production Manager, Finspong
Haglund A-L. Procurement Engineer
Hedlund M. Purchasing Director Siemens PGI4
Karebo M. Personnel Manager, Finspong
Lindblom H-O. Supplier Development Engineer, Finspong
Lister A. Purchasing Manager Core Engine, Lincoln
Nygren S. Purchasing Manager Packaging, Finspong
Nyström F. Consultant, Finspong
Rapp N-G. Purchasing Manager I1, Finspong
Rothwell J. Purchasing Manager Packaging, Lincoln
Sleman T. Manager Business Excellence PGI4, Finspong
Togher J. Manager Supplier Development Engineer, Lincoln
Villegas J. Competency Manager I4, Finspong
Appendix 5: Interview Questions for Background

To people at other departments:

1. In what way does your department co-operate with procurement?
   a. With what function profiles?
2. How well does the co-operation function?
3. Are there any conflicts between the departments?
4. Do you experience any deficiencies within procurement (e.g. lack of competency within certain areas) that leads to problems for your department?
5. Do you have any suggestions on how procurement should change in order to improve their results?
6. What kind of people do you think are most suitable for working within procurement?
7. Have you experienced that the result and profile of procurement have varied over the years?

To employees within procurement:

8. What are your tasks?
9. How do you co-operate with other function profiles within procurement?
10. What is your opinion about the electronic Siemens tool you are obliged to use?
11. Would you like to get some kind of education in order to perform your tasks more efficiently?
12. What do you think about the current procurement organization?

To get some comments on historical development:

13. How long have you worked within procurement?
14. Has procurement always been its own department?
15. How have the tasks and responsibilities of procurement changed over the years?
   a. How do you expect it to change in the future?
16. Have you experienced that procurement has raised its profile within the company over the years?
Appendix 6: Main Questions for Interviews with Purchasing Professors.

1. Which macroeconomic trends do you think will have the greatest impact on purchasing in the next decades?

2. How do you think the purchasing function will evolve? (new/changing/disappearing task)

3. What kind of people, in your opinion, will be the most suitable for purchasing in the future? (operative, strategic, managers)
Appendix 7: Grouping of Competencies
Description of the competencies included in the headlines presented in the star diagrams.

**Key commodity managers**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Target</th>
<th>Finspong</th>
<th>Lincoln</th>
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</thead>
<tbody>
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<td></td>
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<tr>
<td>a) the objectives and strategies of Siemens PGI4?</td>
<td></td>
<td>2.50</td>
<td>2.75</td>
</tr>
<tr>
<td>b) the values of the company (corporate social responsibility policy etc)?</td>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>Personal driving force</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>g) finding out solutions to arising problems</td>
<td></td>
<td>4.00</td>
<td>3.50</td>
</tr>
<tr>
<td>i) power of initiative (e.g. bring up suggestions on improvements)</td>
<td></td>
<td>3.50</td>
<td>3.75</td>
</tr>
<tr>
<td>j) realisation of improvements</td>
<td></td>
<td>3.00</td>
<td>3.50</td>
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<td></td>
<td></td>
<td><strong>3.50</strong></td>
<td><strong>3.58</strong></td>
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<td>Supply knowledge</td>
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<td></td>
</tr>
<tr>
<td>c) world wide supply markets for the products of Your responsibility?</td>
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<td>3.25</td>
</tr>
<tr>
<td>a) market analysis</td>
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<td>3.50</td>
<td>3.50</td>
</tr>
<tr>
<td>f) understanding of the culture of your foreign suppliers</td>
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<tr>
<td></td>
<td></td>
<td><strong>3.50</strong></td>
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<td>Professional knowledge</td>
<td>3</td>
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<tr>
<td>b) development of purchasing strategies</td>
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</tr>
<tr>
<td>c) Total Quality Management (TQM)</td>
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<td>3.25</td>
</tr>
<tr>
<td>h) different materials’ and processes’ effects on the environment</td>
<td></td>
<td>2.00</td>
<td>2.75</td>
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<td></td>
<td></td>
<td><strong>2.50</strong></td>
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<tr>
<td>Analytical skills</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) ability to analyse the impact of a purchasing decision on different costs (transport, inventory etc)</td>
<td></td>
<td>4.00</td>
<td>3.25</td>
</tr>
<tr>
<td>e) ability to analyse the impact of a purchasing decision on supply chain risks (dependency, natural disasters etc)</td>
<td></td>
<td>3.00</td>
<td>3.50</td>
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<td></td>
<td></td>
<td><strong>3.50</strong></td>
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<td>a) database management (i.e. extract and update data)</td>
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<tr>
<td>b) internet searching (e.g. finding information about potential suppliers)</td>
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<td>3.25</td>
</tr>
<tr>
<td>c) usage of Internet based tools (like e-Net-I, Click-2-procure)</td>
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<td></td>
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<td><strong>2.75</strong></td>
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<td>3.00</td>
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<tr>
<td>a) project management</td>
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<tr>
<td>b) leadership</td>
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<td>3.00</td>
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<tr>
<td>c) conflict resolution</td>
<td></td>
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</tr>
<tr>
<td>d) persuasive powers</td>
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<td>3.00</td>
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<tr>
<td>e) giving presentations</td>
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</tr>
<tr>
<td>f) working in teams</td>
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<td>3.75</td>
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<tr>
<td>h) oral communication in native language</td>
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<td>4.00</td>
<td>3.75</td>
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<tr>
<td>i) written communication in English</td>
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<td>3.00</td>
<td>3.75</td>
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<tr>
<td>j) oral communication in English</td>
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<td>3.75</td>
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<td>a) technical features of the bought products of your responsibility</td>
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<td>b) technical features of the end product</td>
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<td>1.70</td>
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<td>b) values of the company (corporate social responsibility policy etc)</td>
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<td>e) analytical skills</td>
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<td>3,00</td>
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<tr>
<td>f) teaching/pedagogy</td>
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<td>g) IT usage</td>
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<td>b) finding out solutions to arising problems</td>
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<td>2,67</td>
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<td>c) power of initiative (e.g. bring up suggestions on improvements)</td>
<td>3</td>
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<td>d) realisation of improvements</td>
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<tr>
<td>d) realisation of improvements</td>
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<td>3,00</td>
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<tr>
<td>j) planning skills</td>
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<tr>
<td>a) holistic view (ability to take the impact of many different factors into consideration)</td>
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<td>3,00</td>
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<tr>
<td>b) cost analysis (ability to analyse the impact of different decisions on total costs)</td>
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<tr>
<td>c) risk analysis (ability to analyse the impact of different decisions on supply chain risks)</td>
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<tr>
<td>d) ability to analyse the impact of a purchasing decision on different costs (transport, inventory etc)</td>
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**Buyers at Core Engine**

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<td>d) understanding for other cultures</td>
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<td>e) solving problems in dialogue with suppliers</td>
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<p>| 2.50 2.75 |
|<strong>Professional knowledge</strong> | 3 |
| a) working according to defined processes | 2.00 3.00 |
| b) personal driving force (e.g. power of initiative and of realizing improvements) | 2.13 2.33 |
| c) planning with respect to changing conditions in production, deliveries or forecasted demands | 1.88 1.67 |
| d) exchange rate management (i.e. taking the current exchange rate for different supply markets into consideration when deciding on which market to place an order) | 1.25 1.67 |
| <strong>Logistics</strong> | 3 |
| a) holistic view (ability to take the impact of many different factors into consideration) | 2.25 2.00 |
| b) cost analysis (ability to analyse the impact of different decisions on total cost) | 1.63 2.33 |
| <strong>Information Technology</strong> | 4 |
| a) database management (i.e. extract and update data) | 2.50 2.33 |
| b) usage of e-procurement tools (like e-Net-I, Click-2-procure) | 1.25 2.67 |
| <strong>Buyer at Packaging</strong> |
| <strong>Target</strong> | <strong>Aver. Finspong</strong> | <strong>Aver. Lincoln</strong> |
| <strong>Siemens knowledge</strong> | 2 |
| a) the objectives and strategies of Siemens PGI4? | 2.00 2.00 |
| b) the values of the company (corporate social responsibility policy etc)? | 2.00 1.83 |
| <strong>Personal driving force</strong> | 3 |
| e) finding out solutions to arising problems | 2.50 2.40 |
| f) power of initiative (e.g. bring up suggestions on improvements) | 3.00 2.60 |
| g) realisation of improvements | 2.00 2.20 |
| <strong>2.50 2.40</strong> |</p>
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<td>d) different materials’ and processes’ effects on the environment</td>
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<tr>
<td>b) cost analysis (ability to analyse the impact of different decisions on total costs)</td>
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<td>c) risk analysis (ability to analyse the impact of different decisions on supply chain risks)</td>
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<td>d) persuasive powers</td>
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<td>f) working in teams</td>
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## End product knowledge

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## Supplier development engineer

### Siemens knowledge

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### Supplier knowledge

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<td>2.70</td>
</tr>
</tbody>
</table>
Appendix 8: Questionnaire for Consultants

Instructions:
Please answer to the questions by marking a cross in one of the boxes. The answer shall be based on how You estimate Your current level of competency, not on how You think others may interpret You or on how You wish others to interpret You. Save the changes of the document and send it to us by e-mail. Your answers will be treated anonymously.

Answer the following questions in the range from Basic to Expert knowledge.

Basic level*: I have limited knowledge/skill within the concept/activity and little or non experience in applying it in practice.
Intermediate: I have some knowledge/skill within the concept/activity and some experience in applying it in practice.
Advanced: I have almost full knowledge/skill within the concept/activity and I am very experienced in applying it in practice.
Expert: I have full knowledge/skill within the concept/activity and I am very experienced in successfully applying it in practice.

1. To what extent do You have knowledge of

<table>
<thead>
<tr>
<th>Basic</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) the objectives and strategies of Siemens PGI4?</td>
<td>1F, 1L</td>
<td>1F</td>
<td>2L</td>
</tr>
<tr>
<td>b) the values of the company (corporate social responsibility policy etc)?</td>
<td>1L</td>
<td>2F, 2L</td>
<td></td>
</tr>
</tbody>
</table>

2. Estimate your skills concerning

1. Management of internal and external relations

<table>
<thead>
<tr>
<th>Basic</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) project management</td>
<td>2F, 3L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) leadership</td>
<td>1F</td>
<td>1F, 3L</td>
<td></td>
</tr>
<tr>
<td>c) conflict resolution</td>
<td>1F, 1L</td>
<td>1F, 2L</td>
<td></td>
</tr>
<tr>
<td>d) persuasive powers</td>
<td>1F</td>
<td>1F, 1L</td>
<td>2L</td>
</tr>
<tr>
<td>e) giving presentations</td>
<td>1F, 1L</td>
<td>1F, 2L</td>
<td></td>
</tr>
<tr>
<td>f) working in teams</td>
<td>1F, 1L</td>
<td>1F, 2L</td>
<td></td>
</tr>
<tr>
<td>g) written communication in native language</td>
<td></td>
<td></td>
<td>2F</td>
</tr>
<tr>
<td>h) oral communication in native language</td>
<td></td>
<td></td>
<td>2F</td>
</tr>
<tr>
<td>i) written communication in English</td>
<td>1F</td>
<td>1F</td>
<td>3L</td>
</tr>
<tr>
<td>j) oral communication in English</td>
<td>1F</td>
<td>1F</td>
<td>3L</td>
</tr>
</tbody>
</table>

2. Professional knowledge

<table>
<thead>
<tr>
<th>Basic</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) cost analysis</td>
<td>1F, 2L</td>
<td>1L</td>
<td>1F</td>
</tr>
<tr>
<td>b) finding out solutions to arising problems</td>
<td>1F, 1L</td>
<td>1F, 2L</td>
<td></td>
</tr>
<tr>
<td>c) power of initiative (e.g. bring up suggestions on improvements)</td>
<td>1F, 1L</td>
<td>1F, 2L</td>
<td></td>
</tr>
<tr>
<td>d) realisation of improvements</td>
<td>1F</td>
<td>1F, 1L</td>
<td>2L</td>
</tr>
<tr>
<td>e) analytical skills</td>
<td>1F</td>
<td>1F</td>
<td>2L</td>
</tr>
<tr>
<td>f) teaching/pedagogy</td>
<td>1F</td>
<td>1F</td>
<td>2L</td>
</tr>
<tr>
<td>g) IT usage</td>
<td>1F, 2L</td>
<td>1F, 1L</td>
<td></td>
</tr>
</tbody>
</table>
Answer the following questions in the range from Very negative to Very positive.

<table>
<thead>
<tr>
<th>3. What is your attitude towards</th>
<th>Very negative</th>
<th>Negative</th>
<th>Positive</th>
<th>Very positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) regular communication with suppliers?</td>
<td></td>
<td></td>
<td>2F</td>
<td>3L</td>
</tr>
<tr>
<td>b) learning and competency development?</td>
<td></td>
<td></td>
<td>1F</td>
<td>1F, 3L</td>
</tr>
</tbody>
</table>

Answer the following questions in the range from Never to Always.

<table>
<thead>
<tr>
<th>4. As for competency development, do You</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) find it hard to quickly learn new things and develop Your skills?</td>
<td>1L</td>
<td>2F, 2L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) regularly update yourself about technical progress and new tools available?</td>
<td></td>
<td>2F</td>
<td>3L</td>
<td></td>
</tr>
</tbody>
</table>

12. As for formal education, do You

<table>
<thead>
<tr>
<th>12. As for formal education, do You</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) have, for Your responsibilities, a relevant university degree?</td>
<td>2L</td>
<td>2F, 1L</td>
</tr>
<tr>
<td>b) have, for Your responsibilities, relevant professional experience?</td>
<td></td>
<td>2F, 3L</td>
</tr>
</tbody>
</table>