

**An activity based competency model
for ANSP purchasing professionals:
A case study at DFS Deutsche Flugsicherung GmbH**

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Abstract

With the role of purchasing evolved from a paper pushing function to a strategic and value creating player in global businesses (Espich, 2004), the activities of purchasing professionals today are knowledge- and competence driven. The purpose of this study is to identify the competency needs of purchasing professionals at DFS Deutsche Flugsicherung GmbH (DFS), Europe's largest Air Navigation Service Provider (ANSP). It also seeks to explore the role of implicit participant knowledge in the process of competency identification and model development. For these reasons, a mixed-method case study at DFS is conducted. After reviewing the literature, a purchasing competency model is developed from scratch through exploring the target population's self-image on competency needs and by contrasting these results to the view of purchasing department's internal customers and management. The so developed model is then verified through participant observations and the identification of the implicit knowledge of competency needs of purchasing professionals. The study contributes to business practice and the theory of competency modeling. It identifies competencies in an area where little is known about competency requirements and explores the need to consider implicit participant knowledge in the model development process. The research outcomes are valuable to solve a real-world problematic situation through developing an activity based, multi-perspective and future oriented competency model. The study provides an example of how the aspect of implicit knowledge can be integrated when studying competencies. Results from this case in Europe's leading ANSP are likely to be transferrable to other companies in the industry.

Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text.

No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the author and in no way represent those of the University.

Signed

Date

Dedication and acknowledgements

This work is dedicated to my parents, who supported me throughout my life. From the early days when I was unaware of the importance and benefits of education and lifelong learning, they encouraged me to develop and become a confident and reflective individual. They provide me a safe haven and never ask for something in return. Without their unconditional love and goodness, I would not be the person I am today.

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competency studies. His huge expertise and success in academia as well as his great example of how theoretic studies can be of importance and benefit for real-world problems motivated me to proceed with my own research project.

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Abbreviations

ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
BEI	Behavioural Event Interviews
C.A.P.S.	Center for Advanced Purchasing Studies
C.P.M.	Certified Purchasing Manager
CEI	Critical Event Interviews
CIT	Critical Incident Technique
CNS	Communication, Navigation, Surveillance
DFS	DFS Deutsche Flugsicherung GmbH (German ANSP)
EBSCO	Elton B. Stephens Company
EDI	Electronic Data Interchange
EIPM	European Institute of Purchasing Management
EPPI	The Evidence for Policy and Practice Information and Coordinating Centre
ERP	Electronic Resource Planning
FAB	Functional Airspace Block
FABEC	Functional Airspace Block Europe Central
GDP	Gross Domestic Product
HRM	Human Resources Management
IT	Information Technology
JCA	Job Competency Assessment
JIT	Just in time
MBA	Master of Business Administration
NAPM	National Association of Purchasing Management
NCSU	North Carolina State University
NHS	National Institute for Health Research
OECD	Organization for Economic Co-operation and Development
SCM	Supply Chain Management
SES	Single European Sky
TQM	Total Quality Management
UNC	University of North Carolina at Chapel Hill

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1. Introduction and conceptual framework

A paradigm shift of the purchasing function and tremendous market changes in the Air Navigation Service Provider's (ANSP) business pose new challenges for purchasing professionals at DFS Deutsche Flugsicherung GmbH (DFS). As a literature review shows, the new tasks and responsibilities for purchasing demand an updated set of competencies. To make best use of these competencies, they should be documented in a comprehensive and subject-specific competency model. Developing such a model by applying a participatory approach is one main objective of the study in hand. The model should reflect the study population's current situation and future challenges. To ensure model reliability, it will be verified through participant observations and consider implicit participant knowledge on competency needs.

1.1 Chapter overview

Chapter 1 explains the study purpose and justifies the research project by outlining its contributions for theory and business practice (1.2). It then introduces the research problem (1.3) and defines the research questions (1.4) and objectives (1.5) that flow from them. It further formulates the researcher's motivation to undertake a study in the field of purchasing competencies (1.6) and makes assumptions under which the research was undertaken (1.7). To introduce the professional environment and context in which the research takes place, the chapter then outlines the ongoing change process that underlies the ANSP business in general and DFS Deutsche Flugsicherung in particular (1.8.). Finally, the chapter defines some key terms for use throughout the thesis (1.9).

1.2 Research purpose and contribution overview

The main purpose of this research work is to develop and to verify a competency model for a professional group within a company that operates in a unique and volatile business environment. The model development process follows a participatory multi-step approach. Model verification incorporates the target population's implicit knowledge on competency needs. The thesis will discuss the role of implicit participant knowledge when exploring competency needs. The industry in focus is the industry of Air Navigation Service Providers and the professional group under investigation is purchasing professionals. The study is designed as a case study at DFS company, the industry leader in many respects. The case study aims at supporting change of a problematic situation at DFS purchasing department and by this means helping to fulfill stakeholder expectations. Case study results might be transferable to other companies in the industry. As described further down, DFS is a statutory provider of air navigation and related services, a field that is highly safety conscious. Safety in air navigation is the primary company product and is ensured through highest standards in service quality. The focus on service quality demands for professionals that meet the highest quality requirements available. Keeping particular attention on competencies of employees supports meeting the respective company and department goals. One basic assumption of this study is that only competent employees can deliver high quality work and results. The next paragraphs provide an overview on the contribution of the research project. The study aims to contribute to both business practice and the theoretic field of competency identification and competency model development.

1.2.1 Contribution to business practice

The research thesis in hand aims at developing a comprehensive competency model for DFS purchasing professionals. The model should emphasize the special demands that the ANSP business makes on purchasing professionals and should also consider future business and industry challenges which might influence the purchasing professionals' field of activity and competency needs.

A systematic literature review developed in this thesis discovered that a competency model for purchasing professionals in the ANSP-industry does not exist. However, generic purchasing competency information was identified through original research studies. These studies describe desired competencies for purchasing professionals in general, but are mostly unspecific and without significance when asking for requirements of different job profiles in purchasing of particular industries.

The real-world-setting DFS also did not overcome this knowledge gap and missed the opportunity to introduce a subject- and context-specific competency model for its purchasing professionals so far. This is surprising when considering that management by competencies is reported to support employees in achieving desired results, foster self-development and thus support the creation of organizational and personal value (Sinnott, Madison, & Pataki, 2002). The practical contribution of the thesis in hand will be the development of an activity based, practice- and future-oriented, subject- and context-specific and widely accepted competency model and by this means close a knowledge gap and solve a business problem. The possible benefits of such model will be outlined further down.

1.2.2 Theoretical contribution

This study introduces an approach to identify competency needs in a field where not much is written about competency model development (competency modeling). It develops a competency model for a professional group for which no model is documented in literature so far. The research hereby contributes to the field of competency identification and competency modeling particularly in the area of purchasing, where only few research studies exist. Through conducting a case study, the research informs the process of competency modeling in general and specifically in the profession of purchasing and in changing business environments. The study provides a methodological framework for the identification of purchasing competencies in a multi-perspective, context-specific and participatory research approach.

As presented in detail further down, the developed model will be verified through participant observations. Observations serve to explore whether the developed model reflects business practice and whether implicit knowledge on competency needs exists. The latter would be the case when competencies are applied in business practice which have not been made explicit in the model development process. In this way, the thesis provides an example of the incorporation of implicit participant knowledge in the process of competency modeling and verification. The thesis explores whether it is reasonable to consider implicit knowledge in the competency modeling process. The additional focus of this work on implicit participant knowledge therefore contributes to the field of knowledge management and its consideration in the process of competency modeling. A definition on the term *implicit knowledge* will be presented further down.

In summary it can be said that the combination of practical and theoretical contributions of this study will be useful for practitioners as well as researchers of different disciplines. The next paragraph explains in detail the problematic situation at DFS purchasing department and why the research is needed from a practical point of view.

1.3 Problem definition

Within the context of tremendous social and economic changes, raising competition and pressure on companies, organizations as well as authors in the fields of psychology, education and human resource development focus on the competencies of people to drive organizational performance. This can be achieved with a strategy of competency based human resource management (Dubois & Rothwell, 2012; Lawler, 1993). Taking care of employee competencies can contribute to departmental and organizational success as well as to sustainable management of individuals in company environments (Bonder, Bouchard, & Bellemare, 2011). Most world class organizations focus on competencies to boost organizational performance (Coughlin, 1997). Building a competency model is a prerequisite for doing this (Yu-Ting, 2008). A definition of the competency term as well as an introduction to the so called *competency movement* will be presented further down.

DFS management followed the above strategy by implementing a companywide, *generic* competency model in 2004. The model consists of 12 universal competencies which are defined to be applicable to all DFS job groups and positions. However, no differentiated, functional or role specific competency requirements for individual job groups were developed, nor were the generic

model contents ever revised or further developed since their introduction. Many authors in the field of competency modeling as well as practitioners have underlined the need for subject- and context-specific, individual, future oriented models which are in line with the up to date company situation and strategy (Campion et al., 2011; Rodriguez, Patel, Bright, Gregory, & Gowing, 2002; Shippmann et al., 2000). Even though the competency based approach was initiated at DFS by introducing generic competencies, it was not kept up, adjusted or further developed on a departmental level. In order for DFS *purchasing* department to continue, update and further develop the competency based approach and to exploit the potential of competency modeling, competency needs of purchasing professionals should be identified and organized in a reliable framework: a purchasing competency model.

The lack of a competency model for DFS purchasing professionals leads to a number of practical problems and uncertainties of purchasing management as well as employees. Firstly, there are no defined competency needs for the various roles in purchasing department. This means that the requirements necessary to successfully operate in specific purchasing roles are unclear, inconsistent and at best individually agreed between management and employees. Without the knowledge and documentation of actual competency needs, the department lacks a tool for measurement and identification of individual and group performance and learning needs. The examination of competencies that individuals possess or need to acquire and the development of effective human resources measures remain subjective and unsystematic. Also, poor hiring decisions in the past made apparent that there is a lack of information on which competencies should be prerequisite for new staff. Vague

wording when setting up job advertisements led to extra effort and waste of resources, which is clearly one costly consequence of the lack of a competency model. Identifying the right people for key roles is one of the most important tasks of purchasing management. To support this goal there is a need to explore what the necessary competencies are for vacant positions. Another open issue at DFS purchasing is the development of career-pathways and succession planning, which is impossible without a competency model that covers current and future competency needs of purchasing staff. The development of career plans and training maps which support company- and individual goals are possible with a competency model (Ennis, 2008).

Moreover, a DFS internal purchasing employee survey in 2010 revealed that DFS purchasing professionals do not have a clear picture of the expectations of both purchasing management and customers on their role, tasks, activities and competencies. This critique was raised again when I talked to potential study participants before starting the case study. Especially young colleagues at purchasing department request a framework or tool to help self-assessment of the current status of competency compliance – and to have a guideline and clear picture about requirements of higher career levels they might wish to reach. It was therefore decided by purchasing management to tackle this problem and to put the topic on the list of goals.

Various ways are possible to formally introduce competencies in the company environment. As described further down, the above situation provides an opportunity for research in this area. As a systematic literature review revealed, a specific competency model for ANSP purchasing professionals does not exist. However, existing research has explored certain competency requirements for

purchasing professionals from various viewpoints and for various reasons. A handful of research studies and authors have identified catalogues or frameworks on purchasing professional competency requirements. However, further research is needed to develop a competency model that reflects the competency needs of DFS purchasing professionals and which could even have wider applicability. Even though DFS started implementing a competency based approach to human resources management, specific competency need for job groups such as purchasing professionals were not yet identified. I follow Ricciardi's (2005) argumentation that competency needs should be identified individually and on an organizational or departmental level.

The gap between generic purchasing competency models and actual DFS purchasing professional competency needs might be significant and should be explored through original research. Existing knowledge on competency needs of purchasing professionals might be a valuable source of information and should be identified through an extensive review of the existing literature. For the above reasons and to develop the desired competency model in a scientific approach, the research study in hand was initiated. Model reliability is achieved through following a participatory, multi-perspective approach, by collecting data from different sources, and especially through conducting participant observations to incorporate implicit participant knowledge on competency needs.

The literature review in this study will show that only a little original research on purchasing professionals' competencies exists. Only very few sources cover competency modeling in specific industry or company environments. Researchers in the field have difficulties finding recent studies from a

practitioner point of view which provide a study design, methodology and useful combination of methods that could be adopted for the sensitive process of in-house competency modeling. Also, virtually nothing is written about implicit knowledge consideration in competency model development. As it is the objective of the study to develop a comprehensive and reliable competency model, it is problematic not to know how to deal with possible implicit participant knowledge on competency needs or whether this knowledge is worth to be considered at all.

This problem definition led to the formulation of research questions, which will be presented in the next paragraph.

1.4 Research questions

A. What are the competency requirements of DFS purchasing professionals?

Sub-questions

- *What are the actual tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

Research question A will be answered from the purchasing professionals' perspective (self-image) and through collecting **quantitative questionnaire data**.

B. Does the purchasing professionals' self-image on competency requirements reflect customer and management expectations?

Sub-questions

- *What are customer and management expectations on tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

Research question B will be answered from perspective of purchasing department's internal customers and purchasing management (public-image) through collecting **qualitative interview data**.

From the data collected to answer research questions A and B , a competency model for DFS purchasing professional will be developed .

C. Does the purchasing professionals' self-image on competency requirements reflect business practice?

Sub-questions

- *Is there implicit knowledge of competency needs?*
- *Does the model need to be amended?*

Research question C will be answered through collecting **qualitative observation data**.

Through answering research question C , the developed competency model will be verified .

1.5 Research objectives

This research aims to contribute both to my professional working environment (practical), the German Air Navigation Service Provider DFS Deutsche Flugsicherung GmbH and to the field of (purchasing) competency modeling (theoretical). Through a case study at DFS purchasing department, a practice oriented and context-specific model for a professional group in a unique business will be developed. After development, the model will be verified through exploring implicit knowledge on competency needs through participant observations. The role of implicit participant knowledge in the process of competency identification will be discussed.

Easterby-Smith, Thorpe, and Jackson (2008) underline the importance of clearly defined research objectives before selecting the methods of data collection in management research. The research objectives flow from the above research questions and are summarized as follows.

- 1. To develop a competency model for DFS purchasing professionals which considers**
 - current and future purchasing activities and competency needs
 - different stakeholder perspectives and expectations

Research objective **1** is achieved by answering research questions **A + B**.

- 2. To verify the developed competency model and to explore the role of implicit knowledge in competency model development by**
 - observing purchasing professionals' behaviour in business practice

Research objective **2** is achieved by answering research question **C**.

Model development: The first research objective is to develop a competency model for DFS purchasing professionals. The study hereby seeks to identify which competencies are the most important ones for the purchasing activities performed. This will be initially achieved by exploring the view of DFS *purchasing professionals* on this question (research question A). However, as purchasing department is an important service provider at DFS, the research design also acknowledges other stakeholders' evaluations on current and future purchasing competency needs. Therefore, the study explores whether the purchasing professionals' above self-image matches the views of *purchasing customers and management* (research question B). This public-image will be identified through exploring the views and expectations on current and future purchasing activities and competency needs of this target population. The competency model will be developed from the analysis of both above datasets.

Model verification: The second objective of this study is to verify the developed competency model and to explore the role of implicit participant knowledge in the process of competency identification. Even though the research design includes acknowledgement of different stakeholder viewpoints as well as an element of iteration (processing of interim data through a group of experts) and thus enhances reliability and acceptability of the developed model, further model reliability will be achieved through participant observations and the identification of implicit participant knowledge on purchasing competency needs. With regard to the existing theory that people sometimes cannot verbally express what they (implicitly) know and that this implicit knowledge is a very important source of information, model reliability will thus be ensured from a knowledge management perspective. This objective is reached by answering research

question C, which seeks to explore whether the developed model also reflects those competencies of purchasing professionals which are (only implicitly) applied in daily business.

1.6 Personal motivation for studying purchasing competencies

Since working on my bachelor and master theses, I developed a personal motivation in deeply focusing on a topic of interest and writing a more comprehensive and academic paper on it. My desire is to create a piece of work which is of practical benefit and which also contributes to a theoretic, scientific field in development. Doing doctoral research for me combines the advantages of business practice contribution, theoretical knowledge development and expansion of my experiences in academic writing. Besides, improving and demonstrating my ability to undertake a piece of independent and original research by applying various research techniques motivates me to do doctoral studies.

When doing original research, it is crucial to contribute to the knowledge base of a defined scientific field and to become aware of the underlying philosophical researcher assumptions (Paltridge & Sarfield, 2004). However, it was equally important to me that my work contributes to my professional discipline and job. The reason for this is not only because the study was partly funded by my employer, but also because it is my strong desire to practically enhance a current problematic situation in my actual professional job environment: the DFS purchasing department. For these reasons, the doctoral program I choose had to allow for researching real world business problems and should also aim for the development of personal and professional effectiveness. This is one

important reason why I chose to do a DBA programme and not a PhD programme. While not every doctoral work results in a paradigm shift of the discipline under study, in-depth exploration of unknown grounds, the critical analysis of findings, the drawing of conclusions as well as the application of existing knowledge in a certain professional environment to solve an actual business problem perfectly meets the requirements of *original* work. I want to be a reflective and professional practitioner able to create research based knowledge – not only once but constantly during my professional life. Besides, I am interested in going into academia part-time. In Germany, the latter often means you have to hold a doctoral degree, so this research work could also enhance my career opportunities in this respect.

During the work on this thesis, I was promoted to a management level with personnel responsibility. Being in this new role and from the new perspective, I can even better understand the above described problematic situation. This confirmed and even strengthened my belief that the study in hand is of significance and importance.

1.7 Assumptions

This study was conducted based on the following assumptions. Firstly, it is assumed that the study participants are honest and have a real interest in supporting the study by providing high quality data. This assumption is based on the fact that the study participants will also benefit from the study results. Moreover, the author assumes that all participants truly understood the questionnaire and interview questions. This assumption is made because lots

of time was spent to inform and support study participants and numerous opportunities were given to ask questions and to clarify uncertainties.

The study is supported by a representative selection of DFS purchasing professionals (Expert Forum), which will be introduced in detail further down. These representatives are assumed to give honest inputs based on experience and expertise rather than absolute answers. In this context, the author assumes that matching expert views are more significant than single views and that an iterative element of expert participation significantly adds to the study quality.

Even though competency studies were already conducted in the field of purchasing, the literature review shows that this study is unique. Former results are therefore assumed to serve as basis of information, but will not be identical to the findings of this study, nor can they be generalized. Even in case a similar study was conducted in the ANSP industry, it is assumed that qualitative data is time-bound and expert opinions and participant behavior are subject to change, especially in volatile business environments like the ANSP business.

The definition of assumptions also leads to the formulation of study limitations, which will be presented to the reader in paragraph 5.5.

1.8 The changing world of ANSP purchasing professionals

This research project aims at developing a comprehensive competency model for DFS purchasing professionals. As the study in hand is designed as a single case study of a professional group within the unique and volatile ANSP business, it seems important to introduce the industry under investigation from the perspective of a changing business environment. Therefore, the following paragraph explains how change affects the business world in general and the

ANSP industry in particular and thus introduces to the topic of improved competency needs of purchasing professionals, which will be discussed in detail as part of the systematic literature review (Chapter 2).

1.8.1 The changing world of business

Reasons for change. Various authors in the fields of human resources management and workforce skill development identified a number of trends affecting the change of today's business world in the public and private sector. The general shift from a crafting, planting and manufacturing economy to a knowledge- and information-based economy as well as internal and external forces such as a dramatic demographic change (decline in birthrate, retirement of baby boomers), ongoing globalization, a raised demand for cost effectiveness and quality orientation, advanced communication technology, workforce mobility and individualization are key drivers of said change process in the global business environment (Bonder et al., 2011; Lawler, 1993; Ulrich, Brockbank, Johnson, & Younger, 2007).

Impact of change. Organizational success and innovation strongly depends on workforce competencies (OECD, 2011). One dramatic effect of today's rapidly changing business environment is a lack of high level skilled human capital in various industries (Galagan, 2010). Jobs and job descriptions for many positions today underlie an ongoing change to reflect the demands of a volatile business world. The general move to multi task jobs results in an increasing demand for workforce competencies. In a recent study among 500 managers from 13 European countries, 72% of the participants said that companies and the public sector need to increase expenditures on employee qualification to tackle the

problem of skilled worker shortage (Accenture, 2012). The awareness of a changing work nature, the move from low level routine jobs to high performance tasks and the identification of a skills gap in many industries led to extensive competency research in the fields of education and business development. As we will see further down, the development and change of job nature is also true for the purchasing profession (see p. 93).

Activities to face change. With an increased demand for highly qualified personnel, companies have put their focus on evaluation tools like skills gap analyses and company-wide competency management systems (Galagan, 2010). With the overall aim to ensure high job performance and company success, scholars, companies and consultants seek finding solutions to face the challenges of dramatically changed workforce requirements and skills gap. One way to tackle the problem is the implementation of a competency-based human resources management (Dubois & Rothwell, 2012; Lawler, 1993; Lucia & Lepsinger, 1999). The advantages of the competency focus will be examined in more detail further down. The next sections bring in question whether the above trends are also noticeable in the business of European ANSPs and in particular at DFS Deutsche Flugsicherung GmbH.

1.8.2 The ANSP industry in Europe: An introduction

ANSPs are service providers managing and controlling air space and traffic. They are organized as government departments, state-owned companies, or private organizations. 36 ANSPs, each applying different technology and flight procedures, control Europe's airspace which is increasingly reaching its limit (DFS, 2009). In the long run, aircraft movements over Europe are expected to

double or even triple by 2030 (FRAPORT, 2010). To counter this trend and to “*meet the future needs and challenges of a growing air travel and transport industry, the European Commission launched the Single European Sky (SES) program*” in 1999 (FABEC, 2010, p. 1), aiming primarily at restructuring and harmonizing the airspace over Europe as well as airspace navigation. By redesigning Air Traffic Management through replacing the traditional national airspaces with so called functional airspace blocks, airspaces over Europe will be organized according to main traffic flows instead of national borders, as is the case today. Said organization aims at optimizing central European airspace usage and transport capacity, minimizing restrictions to air traffic control caused by national individuality and maximizing airport throughput. Harmonization of technical interoperability, safety management, charging regime, civil-military cooperation as well as a common design and joint management of airspace are SES’s main objectives. However, the future performance of air navigation in Europe will be measured not only by safety, capacity, ecology and efficiency in air traffic but also by *cost effectiveness* (Eurocontrol, 2010). Germany, along with its partners France, Luxembourg, Belgium, Switzerland and the Netherlands is part of FABEC - the functional airspace block Europe central. FABECs main goal is cross-border cooperation in all above matters of air traffic control. It seeks to provide a seamless central European airspace and ATM service, focusing on safety, value-add and reduction of environmental impact. DFS serves as a role model in FABEC due to its size, its long lasting experience and outstanding performance.

1.8.3 DFS Deutsche Flugsicherung GmbH

While Europe's airspace still resembles a patchwork rug, DFS is responsible for air traffic control in Germany. Since 1993, air traffic control responsibilities in Germany switched from the former government agency Bundesanstalt für Flugsicherung to DFS Deutsche Flugsicherung GmbH, which was founded as a private law organized company in full government ownership. Although being organized as private law company (GmbH), DFS has the sovereign tasks of providing air traffic services, air traffic flow management and managing airspace utilization. DFS Deutsche Flugsicherung GmbH is the sole national provider of air navigation services in Germany – the busiest airspace in Europe. Its core business is air traffic control at towers and radar control centers. Control centers in the cities of Langen, Munich, Bremen and Karlsruhe take care of aircraft overflying German airspace, while tower personnel ensure airport traffic safety at landings and departures. Currently, 16 international airports and nine regional airports are controlled by DFS and its subsidiary The Tower Company (DFS, 2009). More than 800 employees at DFS system house are in charge of developing, testing, launching and deploying air traffic control and communication, navigation and surveillance (CNS) systems including hardware, software, equipment and services. Other important business units of DFS are *Aeronautical Information Management* and *Aeronautical Solutions*. In order to capitalize on DFS knowledge and developed ATC and CNS innovations, Aeronautical Solutions as DFS sales and marketing unit brings to an international market what was built in 60 years of expertise in “*developing, implementing and operating technical air navigation services facilities*” (DFS, 2009, p. 1). Moreover, Aeronautical data in form of preflight information and

publications such as maps, books and charts as well as software applications and third party hardware are distributed worldwide through DFS and its subsidiaries. DFS also provides training for German and European air traffic controllers and other service personnel at DFS academy, an institution for education and qualification of operational and administrative staff at DFS headquarter in Langen. Currently, DFS operational and administrative staff as well as technicians and engineers count approximately 5.800 heads. In terms of an overall strategy, DFS objectives are outstanding performance and a premium safety level in delivering services in a sustainable and ecological manner. With a focus on customer orientation, DFS seeks to further increase air traffic performance and to provide attractive jobs for innovative and motivated enthusiasts in aviation and technology (DFS, 2013).

1.8.4 Future challenges of DFS

The ongoing European integration process, amongst other effects, bears some challenges for the DFS core business. The SES initiative and updated European regulations in the field of air traffic control and management are being implemented from 1st January 2012. Core elements of the underlying regulations are a common charging scheme for air navigation services as well as European and national requirements regarding safety, environment, capacity and cost-efficiency. In two steps until the beginning of 2015, the so far applicable full costing recovery accounting cost method, also known as absorption costing is changed to a system of target values and predefined, regulated service charges, determined by national authorities based on European guidelines. With other words, future underfunding in DFS core business units cannot be

balanced by simply raising customer air traffic control fees. Moreover, the overall economic situation, which naturally takes immediate effect on worldwide air traffic volume, challenges DFS future business. Generally, the current economic crisis causes a slowdown of the global economic growth rates. With a rate of only 0.7% in 2012, the gross domestic growth decreased to only 15% of the rate from 2010. The German GDP declined by 0.6 percent in the fourth quarter of 2012, compared with the previous quarter. In 2013, the trend continued and for 2014 and 2015, expectations on economic growth are cautious due to overall economic risks and the pressure to consolidate public finances. This trend also continues for the area of expectations for future global air traffic. Air traffic is being negatively impacted not only by a stagnating European economy, but also by political and social turmoil in Arabic and North African countries. Global economic and sovereign debt crisis, the ongoing financial market uncertainty, and also raised oil and kerosene prices create particularly difficult challenges to DFS and its customers. Furthermore, the European Commission decided to include aircraft emissions to the emissions trading system, meaning that airlines are obliged to purchase emission certificates, which puts additional financial pressure on DFS customers. Last but not least, new German tax laws introduced an air transport tax as of 2011, to be paid by carriers departing from German airports and raising ticket prices by approximately 2%. Increased sensitivity regarding aircraft emissions (noise and pollutants) by German citizens, especially in heavy traffic airport areas, has put enormous pressure on politics during the last years. As a consequence, strict bans on night flights as well as ongoing discussions on airport expansions slow down air traffic growth. DFS customers' reactions reach from strict expenditure

and cost cuts (reductions in aircraft fleets and the cancellation of routes) to cooperation and mergers, which in turn results in raised market power of said companies. The above described development led to a trend of reduction of aircraft movement in Germany compared to previous years.

To meet the future challenges and to actively take countermeasures on the described development, a five-point-program and strategy was developed and introduced by DFS executive board and managers. Albeit somewhat blurry regarding the intentions to influence the described regulatory framework and to raise productivity and cut costs, one main future focus lies in the plan of realigning and further developing DFS human resources management. Another important aspect is the plan to expand DFS commercial business, which is not core business and not regulated (Aeronautical Solutions). Raising productivity by 3% and cutting costs by 1.5% per year are ambitious goals and DFS executive board pointed out that implementation and realization is a companywide concern and that all departments and employees will have to take part and support the initiative in order to be successful.

Summing up it can be said that the ANSP industry and especially DFS is not spared by the general trends affecting the business world. DFS management made clear its desire to master the challenges and expressly underlined the role of human resources management and employees in the company strategy. This management focus is also reflected in the DFS vision statement, which refers to performance, customer orientation, innovation and employees:

“DFS is committed to delivering outstanding performance to its customers. Safety is our top priority. Services are being tailored to the differing customer needs in an environmentally sustainable manner. As a recognized partner of air

navigation services for complex airspaces and airports, we will improve the performance of the air transport system. DFS offers challenging work for aviation enthusiasts and innovative people from around the world seeking the opportunity to shape the future of air transport” (DFS, 2013, p. 1).

1.8.5 Focus on competencies

The move from a job-based to a competency based approach to human resources management was suggested by various authors over a considerable timeframe (Bonder et al., 2011; Dubois & Rothwell, 2012; Lawler, 1993; Lucia & Lepsinger, 1999; Ulrich et al., 2007). The emphasis on competencies in many professional disciplines and studies has its roots in the 20th century volatile business world and updated job requirements. Globalization, multi task jobs, cost pressure and other effects demand for new workforce competencies. As we have seen, the trend of a changing work nature can also be observed in the ANSP business, which is influenced by internal and external forces now and in future.

Many organizations identified a lack of necessary competencies in their workforce and seek to close the skills gap by introducing a competency based human resources management (McClelland & Boyatzis, 1980; Rodriguez et al., 2002). As outlined in the literature review, organizations and researchers agree on the benefits of focusing competencies and competency modelling to successfully leverage human capital.

The changing work nature and resulting skills gap is also described in purchasing literature. However, the focus on competencies in the purchasing profession is also influenced by another effect. As we will see in the literature

review, authors in the field of purchasing and supply management confirm that a paradigm shift in purchasing moved the profession from a mostly clerical and support function to a value adding function with strategic relevance and impact. The new role of purchasing demands an updated set of purchasing competencies and it therefore appears that the need for competency modelling in *ANSP purchasing* is triggered from two sides.

1.9 Key term definitions and reference to research study

For adoption throughout this research study, the following key term definitions shall apply. The definitions were developed through reflection on prevailing opinions of authors in the subject and through the discussions of the Expert Forum members (see 4.1.2).

1.9.1 Competency

A huge variation of definitions was developed for the idea of competency. These definitions often depend on researcher perspectives, individual study focus or personal attitude of the researcher. Following the example of Mulder (2001), a working definition was developed after reviewing some prominent and prevailing definitions in the literature .

Early scholars in the field define competencies as applied characteristics of a person which result in a certain degree of performance. They are described as specific personal qualities that are “*causally related to effective and / or superior performance*” (Boyatzis, 1982, p. 23) or as “*area of knowledge or skill that is critical for producing the outputs*” (McLagan, 1989, p. 77) and internal capabilities which are expressed in job behaviors. Karmel (1985) takes up

Boyatzis's above definition to describe job specific competencies as abilities to effectively apply knowledge and skills to achieve a certain purpose.

Some more recent competency definitions can be found in studies on (job) performance improvement. In the field of business and management sciences, competencies are described as measurable compilations of knowledge, skills, experience and personal qualities (Athey & Orth, 1999; Mirabile, 1997; Rodriguez et al., 2002; Wilson, Lenssen, & Hind, 2006). They are also described as personal attributes required for successful performance (LaRocca, 2012). Some authors also underline the importance of the combination of attributes and define competencies as a fusion of knowledge based understanding and skills (Mayer, 1992) or even a collection of characteristics working in concert (Weatherly, 2005).

Spencer and Spencer (1993) somewhat more broadly define a competency as an underlying characteristic of an individual that is related to performance in a job or situation. Weinberg (1996) further broadens the competency definition and adds the interesting aspect of behavior. In the context of vocational training, he describes competency as all attributes that enable an individual to perform and everything the individual is capable of. This includes all his knowledge, behavior and ways of thinking. Ricciardi (2005) takes up this aspect and defines competencies as products of right behaviors. Brown (2006) adds that competencies are something that must be demonstrated to be effective in a task, function, job or role.

Competencies are also described as context-specific, which means that the degree of importance of certain competencies can vary depending on the

environment or job position in focus (Boyatzis, 1982; Youn Chyung, Stepich, & Cox, 2006).

Some authors underline that competencies are different from knowledge, skills, and motives (Schoonover, Schoonover, Nemerov, & Ehly, 2000) or knowledge, skills, and abilities (Sinnott et al., 2002) and that they also encompass personal characteristics. Yu-Ting (2008) provides a summary of this discussion, and explains that competencies were defined as measurable patterns of knowledge, skills, abilities, behaviors, and other characteristics that differentiate high from average performance (Mirabile, 1997; Rodriguez et al., 2002).

Considering all the above thoughts and from discussing the questions *what characterizes competency?*, *how to obtain competency?* and *how can competencies be structured?* in the Expert Forum, the following working definition was developed.

Competencies are combinations of subject specific knowledge, behavior, capabilities and personal attributes an individual needs to successfully perform in a certain context.

For the use in this research study, the so called *generic competencies* are considered common competencies, which are often called soft skills. Examples of generic competencies are communication or analytic skills. Generic competencies are considered non-functional or non-technical competencies which could be applied to various professional groups. *Functional competencies* in contrast are considered job-specific competencies which are identified in a certain professional context.

It is safe to say that there is no universally valid competency definition, but it is interesting to see that the term *knowledge* appears in many definitions found. However, there is no indication that a distinction is made between implicit and explicit knowledge when defining competencies. It will be interesting to see how the aspect of implicit knowledge might add to the current definitions.

An additional view on the competency term and its emergence and development over several disciplines is part of the literature review on the competency movement and competency based human resources management (Chapter 2).

1.9.2 Competency model

Competency models can be simple lists or catalogues of attributes or visual models including definitions and behavioral indicators. In literature they are defined as descriptive tools that identify knowledge, skills, abilities and behavior needed to perform effectively in an organization (Dalton, 1997; Ennis, 2008; Lucia & Lepsinger, 1999) or simply as behavioral job descriptions (Fogg, 2006) or as clusters or integrative sets of competencies, skills and behaviors organized for the purpose of simplification (Lucia & Lepsinger, 1999; Mirabile, 1997).

Dubois (1993, p. 9) underlines specific contexts and job roles when defining competency models and described them as "*those competencies that are required for satisfactory or exemplary job performance within the context of [...] job roles, responsibilities and relationships in an organization and its internal and external environments*". Dubois later referred to competencies as narrative descriptions of critical requirements for a job, role or organization (Dubois & Rothwell, 2012).

From the definitions found in literature, the ones of Dubois (1993) and Dubois and Rothwell (2012) are preferred, as they focus on the context and job roles or organizations for which a competency model is developed.

Many definitions include the aspect of knowledge. However, from the author's point of view, the term *knowledge* should be defined more precisely in the context of competencies and competency models. So far, no definition that distinguishes between implicit and explicit knowledge could be found. A more detailed view on competency models, their advantages and the process of model development will be presented in the literature review.

1.9.3 Knowledge management and implicit knowledge

Knowledge management is a topic of big interest and relevance to both business and the academic world in various disciplines. It can be defined as "*multi-disciplined approach to achieving organizational objectives by making the best use of knowledge*" (UNC, 2013). Data becomes knowledge when we learn how to recognize and use the value it could provide. Achieving this goal is one main objective of knowledge management.

When talking about knowledge, at least two kinds of it - implicit and explicit - can be distinguished. Basically, *implicit knowledge* is knowledge that is not explicit. It is about people knowing something or how to do something, but cannot explain or describe explicitly what they know. It is applied indirectly or unintentionally (Kirsch, 2008). Originally described by Polanyi (1966) as tacit knowledge, and sometimes simply referred to as *know-how* (Brown & Duguid, 1998), Boisot, MacMillan, and Seok Han (2008) define implicit knowledge as non-codified, experience based and intuitive knowledge which is personal- and

context-dependent and difficult to communicate. Implicit knowledge is personal in nature and deeply rooted in action, commitment, and involvement (Nonaka, 1994). Wellman (2009) regards it as most valuable source of knowledge which is most likely to lead to breakthroughs in organizations.

I consider the contributions of Nonaka (1994) and Wellman (2009) highly interesting and also applicable for the field of competency model development. When implicit knowledge is the most valuable knowledge source, it might be crucial to identify this kind of knowledge when developing competency models. When implicit knowledge is rooted in action, it might be possible to explore it when observing the behaviour of people. Exploring implicit knowledge might therefore be a productive tool for verifying competency models that were developed through collecting explicit forms of knowledge.

Kirsch (2008) adds that implicit knowledge must be differentiated from tacit knowledge. Implicit knowledge is non-codified knowledge which still *can* be codified while tacit knowledge may well be impossible to codify. Implicit knowledge is that which is entangled with explicit knowledge whereas the central aspect of tacit knowledge becomes its silence. The use of the term implicit knowledge is therefore preferred in this context. Implicit knowledge *“is knowledge that has not yet been put together either by expression, concept development, assumptions that lead to principles, or through analysis of facts or theory”* (Kirsch, 2008, p. 1). The same author also adds an example of implicit knowledge, which fits perfectly to my approach and thoughts of integrating implicit knowledge in the competency modeling process:

A good example of implicit knowledge in an organization could be found in asking a worker how a task is to be performed and to ask what the range of

outcomes might be for the task or even portions of the task. At the onset of the discussion the range of outcomes described may well be significantly different than the actual performed or observed range of outcomes (2008, p. 1).

As described above, one main objective of this study is to develop a competency model based on questionnaire and interview data. However, the aspect of implicit knowledge is incorporated as I hope to receive further competency information (data) from observing what knowledge or competencies are actually applied by DFS purchasing professionals (study participants). Participant competencies applied unintentionally might be valuable to inform and further elaborate the model which was developed by collecting explicit participant information only (knowledge about competency needs from questionnaire and interview data). Comparing the implicit knowledge to the (explicit) questionnaire and interview data might reveal a gap in the developed model. One outcome of this study might be an indication that developing competency models without considering implicit knowledge results in imperfect outcomes.

1.9.4 Purchasing

For the thesis in hand, *purchasing* is defined as all efforts of DFS purchasing department and its professionals that aim at acquiring goods and services from sources outside DFS. The term *purchasing* may also be used as expression for the (DFS) *purchasing function*. The purchasing function is defined through the various activities of purchasing professionals under their individual responsibilities. The work in hand will identify these responsibilities and purchasing activities as well as the competency needs of DFS employees at purchasing department (purchasing professionals).

2. Systematic literature review

2.1 Introduction

This chapter presents a review of literature in my field of studies. Through synthesizing included literature sources, it aims at revealing prominent themes in the discipline of purchasing competency studies. The review methodology followed is described and the reasons for choosing specific review techniques are justified. The review covers quantitative and qualitative research evidence on purchasing competencies with a focus on competency based human resources management, competency modelling as well as current and future purchasing competency requirements. It identifies the literature on purchasing competencies, competency identification and competency modelling and gives an overview of existing research studies in this emerging discipline. Furthermore, it seeks to find evidence of implicit knowledge integration in the process of competency modelling and industry specifics in purchasing competency needs. The overlap of study fields *purchasing*, *competencies* and incorporation of the *implicit knowledge* aspect is reflected in the search term selection and combination as described further down.

2.1.1 Literature review objectives and contribution

The general intention of this literature review is to situate my research project in relation to current knowledge. Its primary objective is to map and assess existing intellectual territory, which is widely regarded as one of the main reasons for conducting literature reviews (Saunders, Lewis, & Thornhill, 2009; Tranfield, Denyer, & Smart, 2003). By analyzing the existing body of recorded work, the chapter aims at developing an understanding and insight into previous research

and selected trends, opinions and controversies that may have emerged from it. By reviewing the sources identified as relevant, it makes sure that the predefined research questions have not already been answered and that there is a gap in current knowledge that might be worthy of further investigation. In this way, the review helps substantiating and adjusting the research questions when necessary and explores further research possibilities. The review is directly related to the research questions and aims at synthesizing what research has already been done to answer them. The contribution of this literature review lies in the identification of major research streams and in revealing research opportunities. It also provides insights into research methodologies appropriate to answer my research questions. Summarized, the review substantiates the contribution of the work to business practice and science.

The systematic literature review is part of multi-phase research design which will be described in detail in Chapter 3. For an overview of the research phases and applied methods in each phase, see Annex 8.

As Figure 1 below shows, the literature review also supports the next research phase through identifying information on purchasing professional competency needs from the included literature sources. These identified purchasing competencies could be called a byproduct (supportive data) of the literature review. This supportive data, a synthesized list of important purchasing competencies on a high abstraction level, was used to inform and prepare the phase of model development as they were later incorporated into one strand of data collection (questionnaire). By this way, the literature view on competency needs of purchasing professionals is considered in the model development

process. Rodriguez et al. (2002) confirm that competency model development can begin with a comprehensive literature review. *“The goal of the literature review is to develop comprehensive competency and task lists for an occupational group”* (Rodriguez et al., 2002, p. 3). A detailed discussion of the initial data collection during the literature review is presented in Chapter 4, paragraph 4.1.1.

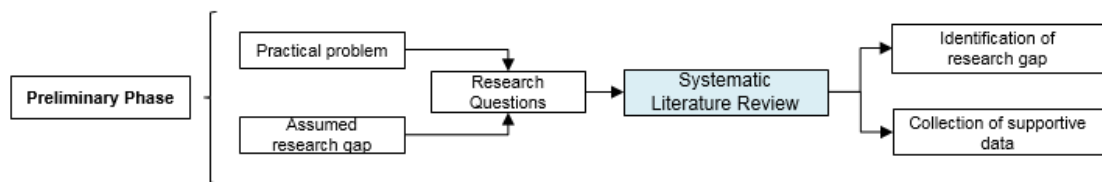


Figure 1 - Preliminary phase

2.2 Literature review problem formulation

A literature review is usually conducted due to a lack of information on the literature base of a topic and thus aims at expanding researcher knowledge (Saunders et al., 2009). Instead of broadening the actual research questions, Randolph (2009) suggests outlining what questions the literature review itself should answer. To formulate a problem for the literature review seems to be profitable for this research study as well. Firstly, it will be helpful not to lose the focus on the research questions. Secondly, it will guide the decision about sources to include in the review. I consider these aspects particularly important as the literature bases of the disciplines covered by my topic are huge and difficult to manage without a clear focus and objective. The literature review objectives were therefore formulated in questions (problem formulation), which clearly have to be distinguished from the actual research questions (Randolph, 2009). The questions below guided me when choosing literature sources for an

in-depth review and helped focusing on literature that contributes to reach my research objectives.

- a. *What role do competencies play in literature and what are the main areas of interest and application with relevance to my research questions?*
- b. *How are competencies used and applied in company environments, what aspects are frequently discussed in this context and what are the implications for my case study?*
- c. *What is the literature view on current and future competency requirements of purchasing professionals and competency modelling in the profession and what are prominent themes under discussion? Are there sources discussing the aspect of implicit knowledge integration in (purchasing) competency model development?*
- d. *Were competency requirements of purchasing professionals in the ANSP business subject to former research? If not, could more general research outcomes be shifted to this specific context?*

The above questions will be answered in the literature review conclusion (2.7).

As we will see further down, I chose to conduct a largely *systematic* and not narrative review of the literature. This fact is already implied in the problem formulation, as it aims at revealing main areas of interest, frequently discussed aspects and prominent themes in literature. However, some more descriptive and introducing parts of the review may concentrate on key authors and random sources which were not discovered through the systematic review methodology as described later.

2.3 Literature review methodology

There are many approaches for obtaining knowledge. This could be through personal experience or through reflection on one's own performance. Alternatively it can be socially derived, for instance through the exchange of experience with peers and experts or through attending conferences or professional training, but the outcomes of said measures are most likely to be subjective and might therefore be unreliable. Additionally, single sources of information can rarely provide a general or even definitive answer to specific questions. Especially when undertaking research to tackle theoretical as well as practical problems, it might be necessary for a researcher to choose a more comprehensive way of gaining knowledge. One such possibility to close a knowledge gap is conducting a review of the existing literature base. The two main approaches to reviewing literature are *narrative* and *systematic*. The next paragraphs will briefly balance the characteristics of said approaches, aiming to find arguments to decide for either approach to apply in this research study.

2.3.1 Narrative reviews

Narrative reviews are the traditional approach to literature reviews as part of scientific research studies. Even though they usually do not describe the review methodology applied, they are widely used by researchers today and, when done properly, can provide critical analysis of recent publications and up-to-date knowledge about a defined topic (Cipriany & Geddes, 2003). By covering a wide range of issues, narrative reviews generally are comprehensive, but often do not reveal how decisions were made in regard to relevance and validity of included sources (Collins & Fauser, 2005). Narrative reviews are intuitive

aggregates of individual research findings (Johnson, 1989) and have some advantages and a distinct characteristic which provides the possibility to cover much broader questions compared to systematic reviews. They allow for the specific selection of key texts and deep concentration on selected aspects in a certain field of enquiry, which gives the researcher more space and flexibility to critically examine the sources and statements and possibly question the assumptions and ideas behind them in more depth. Narrative reviews describe arguments, current states and latest developments in focused areas of inquiry. In this way, they may construct theoretical spaces and present new insight to address identified weaknesses or omissions of selected key texts (Rumrill & Fitzgerald, 2001). Also, narrative reviews can be less time consuming compared to systematic reviews, which makes them a good choice for practitioners aiming to conduct a literature review.

However, one limitation I see with narrative reviews is that different reviewers might have diverse opinions on what the key texts and the most influential authors in a topic area are and how they should be selected for doing a narrative review. This might be an argument that narrative reviews are less objective and reproducible compared to systematic reviews. Narrative reviews may lack thoroughness and possibly emphasize whatever points the researcher desires. *“In [...] narrative reviews, authors pick [...] the studies they discuss and the depth at which they discuss them. Consciously or not, their biases and interests [...] affect how they present the findings [...]”* (Bent, Shojania, & Saint, 2004, p. 249). Conclusions made by the researcher even may be drawn, if necessary, in spite of the facts in evidence (Dijkers, 2008). This level of subjectivity may result

in severe inconsistencies of research findings among reviews on identical issues (Ladhani & Williams, 1998; Suri, 1998).

Especially inexperienced researchers who approach a topic for the first time might find it difficult to conduct a solid narrative review. The consequences of low quality reviews can be far-reaching, for example in *healthcare* science and when decisions in practice are based on knowledge gained from literature reviews (Cook, Greengold, Ellrodt, & Weingarten, 1997). As a reaction on the critique on narrative reviews, evidence-based practice in healthcare disciplines took up a central position from the early nineties and was later even described as a *movement* aiming to establish a new knowledge regime (Tanenbaum, 2005). The quality of the review process was improved by designing and conducting research in a more systematic, transparent and reproducible manner (Tranfield et al., 2003). During the last two decades, evidence started to play a more important role in the decision making process. In many natural science disciplines, researchers even defined *hierarchies of evidence*. These pyramid-shaped models consider expert opinions and experience as the weakest level of evidence whereas systematic reviews are found at the pinnacle.

Even when pointing out some strengths of narrative reviews and claiming that the majority of review articles are narrative rather than systematic, Collins and Fauser (2005) agree that systematic reviews are more appropriate for research with a focused and clearly defined topic and specific research questions. However, the above statements should only be understood as possible drawbacks of narrative reviews and consequences of incorrect review practices for example by inexperienced reviewers. Either way of reviewing the literature can bring valuable contributions if conducted properly. The researcher should

choose his own way based on the intended goals of the review, the area of research and his experience.

2.3.2 Systematic reviews and reviews in management research

In contrast to narrative reviews, a systematic review is an overview and synthesis of sources which contains a statement of objectives, materials used, and methods applied. It synthesizes the literature according to an explicit and defined methodology (Greenhalgh, 1997; Saunders et al., 2009; Tranfield et al., 2003). Systematic reviews develop methods of locating relevant publications on defined topics, including explicit criteria addressing content and methodological quality. By using specified criteria, the systematic review attempts to reduce reviewer subjectivity. It involves clearly stated, explicit and transparent methods for reviewing the literature which are comprehensible, reproducible and objective (Collins & Fauser, 2005). Systematic literature reviews are therefore widely regarded as providing good quality evidence (Tranfield et al., 2003).

In today's volatile business world, fast and far ranging management decisions have to be made. Therefore, reliable information and transparency is of essential value for practitioners in the decision-making process. Evidence from systematic literature reviews can pay tribute to these requirements (Tranfield et al., 2003). Key authors in the field agree that to solve today's management problems, different kinds of evidence are necessary (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005; Tranfield et al., 2003). Focusing on only one kind of evidence could lead to inappropriate decisions as possible alternatives or contradictions within the overall knowledge base might remain undiscovered (Dixon-Woods et al., 2005). Tranfield et al. (2003, p. 207) support this opinion

and emphasize that systematic reviews should be applied to the management field in order to “*produce a reliable knowledge stock and enhanced practice by developing context sensitive research*”. Ideally, the knowledge accumulation aims at providing solutions for specific management problems, or so called “*field tested and grounded technological rules*” (Aken, 2004, p. 222).

In summary, the possible drawbacks of narrative reviews as well as the strong tendency towards evidence-based decision-making resulted in a trend to cover a wider scope of evidence when conducting literature reviews in management research. A pyramid of evidence resources as addressed above might look as follows for the field of management research:

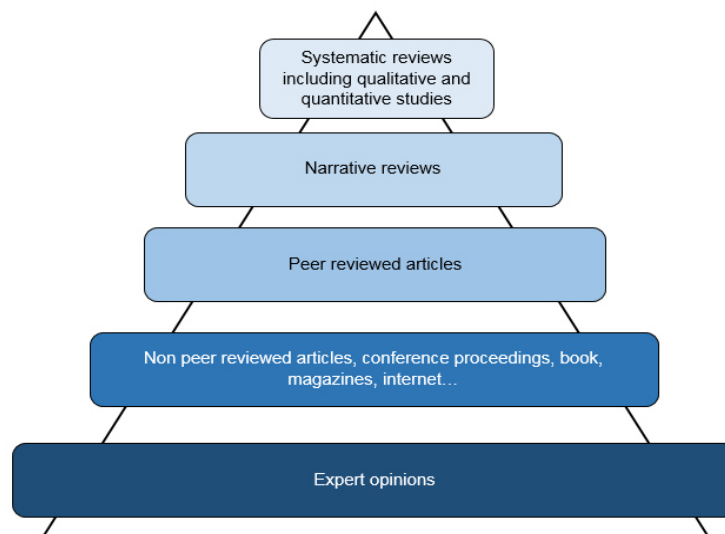


Figure 2 - Pyramid of evidence in management research. Adjusted Evidence Based Medicine resources pyramid as retrieved from <http://hlwiki.slais.ubc.ca/index.php/File:EBMpyramid.gif> on August 11, 2014.

To provide a reliable source of evidence-based information to decision makers and to benefit from the advantages of systematic reviews, Tranfield et al. (2003) advise to apply a *systematic review tool*. The authors describe the systematic review as a 3-step process: Step 1: Planning. Step 2: Conducting. Step 3: Reporting. The main activities when *conducting* the review can be summarized as: 1. Search, identify, select; 2. Quality evaluation. 3. Synthesis. The literature

review as part of this study was conducted in accordance with these steps and will be described in the following paragraphs.

2.3.3 My literature review approach

So in summary, as the goal of my literature review is to identify and synthesize the relevant literature and major streams of research focus areas in the above defined topics, a narrative review is considered less appropriate compared to a systematic review. By balancing the strengths of narrative and systematic literature reviews, Dijkers (2008) argues that the *right* review type depends on the *purpose* of research. One main intention of this literature review is supporting my research study which will provide a reliable knowledge base for decision makers in management. This can better be achieved through credible and systematic synthesis of various sources data sources which, considered separately, would be of lower value (Lazar, 2009).

As presented in Chapter 1, my research project has a clear focus and defined topic. It is also conducted in a volatile business environment and might be the basis for future management decisions. I agree with Collins and Fauser (2005) and Tranfield et al. (2003) and consider it vital to conduct a systematic literature review under these circumstances. A reliable information base and transparency is considered important for reaching the study objectives.

The methods for systematic reviews as described by Tranfield et al. (2003) were in large parts adopted, even if critics of the systematic review methodology are acknowledged. The basic principles of methodology the above authors provided when adopting systematic literature reviews to the field of management

research also correspond to my epistemological position as a researcher, which will be discussed in detail in Chapter 3.

The decision to conduct a mostly systematic review was strongly influenced by the fact that this is my first literature review in the field of purchasing competencies. It might be possible to conduct narrative reviews in future research projects and benefit from the advantages of the narrative review technique. This might especially be the case when my future research problems are again related to the field of purchasing competencies. In this case, I might be confident to have enough knowledge and a good overview of the topic from my earlier (systematic) review and that I can conduct a narrative review without the risk of missing important contributions. Another reason for conducting a systematic review was that I wanted to collect first (supportive) data through the review itself. The supporting data was later used in one part of my questionnaire in the competency model development phase. Collecting supportive data might have been more difficult when conducting a narrative review.

Both ways of conducting literature reviews might have served to close the knowledge gap, but I found a systematic review more appropriate to achieve my individual review goals. The literature review problem formulation as presented above already indicates that I was seeking to identify common streams in relevant literature. This is possible with a systematic review. With a narrative review, I might have missed some important sources.

2.3.4 Synthesizing method

Many different methods for synthesizing literature are discussed in sources on literature review methodology (Dixon-Woods et al., 2005; Saunders et al., 2009; Zikmund, Babin, Carr, & Griffin, 2013). Techniques to synthesize quantitative studies only such as meta-analysis are well established and documented¹ whilst others, for example realist synthesis or thematic analysis which aim to synthesize qualitative studies or even provide methods for combined synthesis of qualitative and quantitative studies, are in earlier stages of development (Dixon-Woods, Agarwal, Young, Jones, & Sutton, 2004). One reason for this is that the arguments against traditional reviews and the interest in diverse evidence is a relatively new trend and not uncontroversial even amongst qualitative researchers (Tanenbaum, 2005). Diverse opinions about analogousness, generalizability and transferability of qualitative study results exist, and it is debated whether meanings of *qualitative findings* can be shifted to a different context without affecting the quality of evidence (Sandelowski, Docherty, & Emden, 1997).

Modern researchers' attitude to the synthesis of research findings within this debate is strongly influenced by their own ontological and epistemological positions and perspective (McDermott, Graham, & Hamilton, 2004). Practitioners in business can be faced with complex questions and a wide range of decisions which can relate to quality, feasibility, acceptability, consequences or organisation. The types of questions to which they may need answers include

¹ For example in the Guidance for those Carrying Out or Commissioning Reviews by the NHS Centre for Reviews and Dissemination, University of York or in various publications of the EPPI Centre, Social Science Research Unit, Institute of Education, University of London, UK

What?, *How?* and *Why?* (Mays, 2006). Decisions on such questions in a management environment can only be made based on diverse evidence such as qualitative and quantitative research studies, reports, peer reviewed articles, books, professional (non-refereed) magazines, peer- and expert opinion as well as personal experience or value judgments (Dixon-Woods et al., 2005; Zikmund et al., 2013).

Many methods available focus on the synthesis of only one type of research, quantitative or qualitative. *Meta Ethnography* for example, originally developed by Noblit and Hare (1988) who set up seven-step process to synthesize findings of qualitative ethnographic research studies enables the reviewer to understand and synthesize study results concerning similar research questions but, in contrast to the more *interpretive* synthesis methods, aims at keeping the individualism of the studies included. Meta Ethnography was therefore rejected for my synthesis as some original studies included in this review are quantitative or mixed method studies.

Meta-analysis on the other side synthesizes data by combining evidence of quantitative studies. Often applied in natural science, statistical methods are used here to question effect sizes obtained from single studies (Dixon-Woods et al., 2005). Critics argue that the results of meta-analysis always depend on the quality of included studies, meaning that even an excellent designed meta-analysis can result in questionable findings when using low quality sources. As the available evidence of my research topic originates from a combination of quantitative as well as qualitative studies and other sources, meta-analysis as an integrative synthesis type is not considered a suitable method for a comprehensive data synthesis. Dixon-Woods et al. (2005) suggest to classify

integrative syntheses as techniques that focus on summarizing research data and where the variables and framework under which data should be summarized are secure and well-specified. *Interpretative synthesis* on the other hand, aims at developing concepts and theories that integrate those concepts. By identifying related concepts, it can be carried out on quantitative as well as qualitative evidence while its main outputs are theory and new constructs, but not the sole aggregation of data (Dixon-Woods et al., 2005).

As my research topic is about competencies of purchasing professionals in a unique and changing business environment and the diverse evidence in this field is largely based on opinions, beliefs, estimations and experiences with a high degree of subjectivity and uncertainty, there are only limited secure and well specified variables or parameters for synthesizing data. The overall aim of my literature review is to assist in dealing with an assumed information overload from different sources and to provide valuable insights through synthesizing. Integration of *qualitative studies* into this literature research by utilizing an interpretative synthesis method will help to reach these goals.

For most research, there is more than one suitable method of data synthesis. The choice for the method adopted is related to form and nature of the research question (Dixon-Woods et al., 2005) and also depends on factors like the philosophical standpoint of the researcher and the overall purpose of the review (Ring, Ritchie, Mandava, & Jepson, 2010). Two popular methods that combine synthesizing different research types are *narrative summary* and *thematic synthesis*. Even though discussed separately in literature, both approaches show some overlap and are inter-related (Dixon-Woods et al., 2005; Ring et al., 2010).

Narrative summary as a more informal approach integrates diverse forms of evidence by discussion and comparison. As indicated earlier, it hereby bears the danger of simply summarizing research findings from what could be seen as randomly selected sources, which is also its main point of criticism. Besides, as it tends to lack transparency and replicability, further development of its methodology is said to be needed (Dixon-Woods et al., 2005). For these reasons, narrative summary was rejected as a method for my review.

The *thematic analysis* approach was introduced by the EPPI Centre and further developed by Thomas and Harden (2007), who term it *thematic synthesis*. In this method, recurring themes or prominent issues in primary literature are analyzed to draw conclusions and to develop analytical themes through a descriptive synthesis with thematic headings (Thomas & Harden, 2008). To further synthesize and go beyond the original findings, the themes developed may be the basis of new or additional ideas, questions or theories of the researcher (Dixon-Woods et al., 2005; Ring et al., 2010). Thematic synthesis aims at answering review questions by taking into account the views and experiences of authors and is therefore a favoured method to integrate qualitative evidence (Dixon-Woods et al., 2005; Ring et al., 2010). Critiques, for example a lack of transparency in the method for identifying prominent topics have their reason in one of the main advantages of this synthesizing method: its flexibility. Acknowledging this argument and to further add replicability and comprehensibility to the review in hand, a synthesis matrix (Annex 1) which will be described in more detail further down was developed. However, the method is further criticized to the extent that there is no clear direction whether a thematic synthesis is *descriptive* only or to what degree it should be *interpretive*

as well. From the author's point of view, the latter question may be left open as long as the literature review reaches the goals it has set itself.

To further face the above critique and to increase transparency of the review, a multi-step process to review the literature was established. After deciding about inclusion of identified sources, qualitative data analysis begins through the identification of key words and coding. Similarities in the findings were then worked out and grouped into a structure from which the most frequent or relevant themes were extracted. The above mentioned synthesis matrix helped to achieve this goal.

Method of reasoning. Amongst scholars, the question whether a thematic synthesis should be either *theory driven* (deductive) or *data driven* (inductive) is also highly debated. While authors following the inductive approach to review the literature try to initially work out review topics or research questions during analyzing the included sources, theory driven reviewers already have ideas or even research questions in mind when starting to extract themes from what they read (Dixon-Woods et al., 2005). Even though I consider this discussion as rather theoretic, I find it important to be aware of its existence and to argument why my research is considered an inductive or deductive one.

My literature review follows a deductive approach, as my research questions were already drafted when starting the review and synthesis of evidence should be orientated towards the ideas and aims of the project. This view is also substantiated by the fact that literature review questions were formulated to guide the systematic review (2.2). Consequently, the themes identified during thematic synthesis were closely related or at least influenced by the defined research questions and literature review problem formulation. Nevertheless, I

remained open minded and receptive for additional or unexpected aspects that might come up during synthesis of sources.

My epistemological position, which directly refers to my assumptions about the best ways of questioning and establishing *truth*, was not clear to me when the work on the literature review started. This means that the methodology followed for the review was not predetermined through any epistemology. In fact, my corresponding epistemology was partly implicated by the choice of review method. However, the review seemed to fit with my epistemological stance which became more explicit during the further research process. My approach to reviewing the literature will be addressed in more detail when discussing my philosophical standpoint as a researcher in Chapter 3. We will see there that although my approach to reviewing the literature was deductive, my approach to collecting and analyzing primary data was inductive.

For the reasons as described above, *thematic synthesis* was chosen as method for this literature review.

2.4 Scoping the literature

The systematic literature review started with a preliminary scoping study to collect information about relevance and size of the literature base within the field of topics. As mentioned by Tranfield et al. (2003), the primary goal here was to delimit the subject area and to give an overview of the disciplines that influence the research question. The scoping was initiated by choosing relevant databases to search the literature. To cover a wide range of sources, the EBSCO online platform with included databases Business Source Complete, CINAHL with Full Text, E-Journals, Education Research Complete, Regional

Business News, SocINDEX with Full Text, British Library Document Supply Centre Inside Serials and Conference Proceedings were chosen.

Then, the following search term combinations were entered.

- a. *purchasing* or *procurement* or supply chain management and *competencies* or *qualification* or *skills*
- b. *competency based human resources management* or *competency modelling* or *competency model*
- c. ANSP or industry and changes
- d. implicit or tacit or knowledge management and competency.

To cover books and unpublished work, the search was expanded to Google Scholar. It was further decided to choose English search terms only, which bears the risk that some relevant German text could remain unidentified. This limitation of the literature search strategy was considered acceptable for the following reasons:

- the English language is the global universal language
- the large majority of scientific work is published in English language
- non English native speakers usually decide to publish their research work in English language to reach a wider audience
- relevant and influential German sources were considered to show up in the reference lists of English sources anyway

Besides, reading and working with German texts *feels* different due to the different writing style of German authors. As the thesis in hand is written in English language and then becomes part of the scientific debate, using English sources only supported the goal to use a consistent writing style.

The literature scoping revealed that the main scientific areas affecting my research questions are subject to rising interest. Authors are picking up various topics related to competencies, competency models, human resources development, purchasing, and purchasing competencies. Also, academia and the professional training industry added the emerging fields of *purchasing and*

supply management, competencies and knowledge management to their curricula. The scoping also showed that only few experts are concerned with questions combining the above topic elements. A handful of studies seem to exist on the requirements on qualification and competencies for purchasing professionals. Most of them are US based and were published during 1993 - 2006. The majority of sources revealed were peer-reviewed articles, whereas many of them were based on original research studies. No sources were discovered that directly apply to my research questions, which is not surprising when considering their specific formulation. Also, as far as the scoping revealed, the changing requirements on employee competencies with regard to the specific ANSP business environment and purchasing profession in focus were not subject to a systematic literature review so far. It was therefore decided to continue the literature review with a more detailed literature search.

2.5 Search strategy outline

Tranfield et al. (2003) suggest outlining the search strategy in detail to ensure replicability and transparency of the search process. Therefore, the following paragraphs describe the search term identification and combination process as well as search term grouping, database searches and search results.

2.5.1 Identification and processing of search terms

The identification and processing of search terms was conducted in a 3-step process. During a long term brainstorming, a large number of possible search terms was identified and assigned to four different categories (Step 1). The categorized terms were then used as a modular system for the creation of

search term combinations (Step 2). Finally, the database search was conducted using reasonable search term combinations (Step 3).

Step 1: Search term definition

Through extensive reading, a catalogue of 39 subject related terms was created. These terms were collected from different sources such as books, journal articles, magazines, reference lists and library catalogues during a timeframe of two weeks in October 2011. Besides, discussions with peers and subject experts expanded the list of possible search terms. On November 11, 2011, the identified search terms were individually processed in an EBSCO database search. To get as many hits as possible, the search was not limited and conducted in: *TX All Text*. The search results ranged from 230.000 hits for general terms like globalization to only a handful of hits for the more specialized ones like FABEC. The reviews of some randomly picked sources discovered that they were in no way linked to my research questions. This indicated a need for using the search terms in systematic combinations to add value to the literature review.

Step 2: Search term combinations

Consequently, it was decided to create categories of search terms to assist systematic search term combination. Four groups (A-D) were created:

Group A: search terms related to business, market and change

Group B: search terms related to the professional group and job titles

Group C: search terms related to professional attributes / competencies

Group D: search terms related to implicit knowledge / knowledge management

The following tables show the defined search terms and groupings.

search terms related to business, market and changes (group A)	
A	
1	Air Navigation Service Provider (ANSP)
2	Air Traffic Control (ATC)
3	Single European Sky ATM Research Program (SESAR)
4	Functional Airspace Block Europe Central (FABEC)
5	Single European Sky (SES)*
6	European Integration
7	internationalization
8	globalization

search terms related to professional group and job titles (group B)	
B	
1	supply (chain) management
2	purchasing
3	procurement
4	buying
5	human resources management
6	professional
7	specialist
8	manager
9	personnel
10	workforce

search terms related to professional attributes / competencies (group C)	
C	
1	competence /competencies
2	skill
3	training
4	education
5	qualification
6	needs
7	expertise
8	ability
9	knowledge
10	requirements
11	model
12	framework
13	assessment
14	analysis
15	identification

search terms related to knowledge (management) (group D)	
D	
1	knowledge management
2	implicit
3	explicit
4	tacit
5	implied
6	silent

Figure 3 - Search term groups A - D

*abbreviation later deleted from list, see explanation further down

The search terms from category A were chosen to cover business and market specific literature sources as well as the aspect of changing market conditions. The search term from group B relate to the profession under investigation and the people working in it. Group C search terms relate to work specific competency attributes. Group D terms were added to cover the aspect of implicit knowledge and knowledge management.

Through combining search terms from the four above categories, the search could be planned and conducted in a systematic manner. The figure below shows all possible search term combinations.

Group A		Group B		Group C		Group D	
Air Navigation Service Provider (ANSP)	and	purchasing	and	competence /competencies	and	knowledge management	
or Air Traffic Control (ATC)		or supply (chain) management	or	or skill	or	or implicit	
or Single European Sky ATM Research Program (SESAR)	or	or procurement	or	or training	or	or explicit	
or Functional Airspace Block Europe Central (FABEC)	or	or buying	or	or education	or	or tacit	
or Single European Sky (SES)*	or	or human resources management	or	or qualification	or	or implied	
or European Integration	or	or professional	or	or needs	or	or silent	
or internationalization	or	or specialist	or	or expertise			
or globalization	or	or manager	or	or ability			
		or personnel	or	or knowledge			
		or workforce	or	or requirements			
			or	or model			
			or	or framework			
			or	or assessment			
			or	or analysis			
			or	or identification			

Figure 4 - Possible search term combinations

Step 3: Database searches

The final database searches with complex search term combinations were conducted in EBSCO and limited to search parameter *AB Abstract*. Combinations of search terms from all four categories (A-D) with an *and* boolean resulted in a maximum of 18 hits only. Strangely, all 18 hits were documents in French language. After reviewing the search terms and results, the word SES (used as a short form for search term Single European Sky) was removed from the search, as *ses* is the French plural term for his / hers. The search was repeated and resulted in zero hits. The finding from this first and comprehensive combination was that no sources cover all the affected areas / search term

categories: business, purchasing profession, competencies and knowledge management. In the next steps, many less complex combinations were entered into the search engine. The following figure shows the used search term combinations and received database hits.

combination (group)	hits
AB	211
AC	188
AD	354
BC	251
BD	56
CD	122
ABC	31
ABD	26
BCD	31
	1270

Figure 5 – Applied search term combinations and database hits

Summarized, through the above described search strategies, 1.270 potential sources were identified.

2.5.2 Inclusion and exclusion criteria and first overview on results

As a result of applying the above systematic search routine, a quite large number of sources was identified as potentially relevant. Almost all abstracts or available summaries of the identified sources were read completely which took about five weeks. However, quite often a quick scan of an abstract and keywords revealed that a source is unsuitable and further reading is not necessary. Summarized, most of the identified sources turned out to be not sufficiently linked to the study focus and therefore not further considered useful. Also, many sources turned out to offer little else than summarizing, confirming and repeating earlier original research and thus added no big value to the

review. Hundreds of sources were identified to cover partial aspects of my topic, but only few sources were seen as useful by the author as they cover a combination of the topics in focus for this thesis. Identified books, book sections, conference proceedings, a few internal and unpublished documents and even some non-peer reviewed articles were included in the literature review. As original research on the topic of purchasing competencies is rare, peer-reviewed articles even if not based on original research and other sources were also considered valuable and were included in the literature review. As the method of academic peer-evaluation prior to publication to assess quality and suitability is employed to maintain standards, improve performance, and provide credibility (Saunders et al., 2009), they were considered as reliable and high quality sources for my review. The figure below shows the numbers of hits and included sources per applied search term combination.

combination (group)	hits	included in review / synthesis
AB	211	22
AC	188	14
AD	354	22
BC	251	19
BD	56	9
CD	122	9
ABC	31	8
ABD	26	4
BCD	31	9
	1270	116

Figure 6 – Search term combinations, hits and included sources

By browsing reference lists of identified sources and Google Scholar, 22 topic related books, book chapters, reports and conference papers were discovered and added to the list of potential sources. 14 of them were used for the literature review.

Despite the above decision to concentrate on English sources, a quick library catalogue search at the archives of the German National Library in Frankfurt, Germany aimed to identify relevant German text books and published master and doctoral theses. This search resulted in 7 additional findings (mostly books or book sections), of which 3 were used for the literature review. Books and book chapters were read in its relevant parts only to identify whether they are relevant sources to include in the thematic synthesis.

In summary, 133 sources were included and used as basis for the review of the literature base. All included sources were read completely and prepared for further analysis. Most of the included sources were later analyzed in detail and included in a comprehensive literature synthesis, as the following paragraphs will show.

One main outcome of the literature search is that only very little original research has been done in the field of qualification and skills of purchasing professionals. Moreover, most studies discovered in the field used mainly quantitative methods of data collection and are not EU-based. The continuing trend for conducting quantitative studies is observable for the field of management studies. This might be explained with the fact that these studies are more publishable according to the academic criteria for review as they tend to more clearly articulate and defend the applied methodologies (Palmer, 1998). This trend can be confirmed for the US based research studies identified.

2.6 Synthesis

This review examines the literature on competencies and competency modelling in human resources management with a focus on the purchasing profession. It also seeks identifying industry specific research in changing business environments as well as competency studies considering implicit knowledge integration in competency model development. As described above, thematic synthesis was chosen as method of literature analysis. The synthesis aimed at answering the questions as defined in the literature review problem formulation (2.2).

An introduction to the industry setting in which this study takes place is presented in Chapter 1. It features a general view on the changing world of business and its impacts on the European industry of Air Navigation Service Providers. It also includes a presentation of the German ANSP DFS Deutsche Flugsicherung GmbH and its current and future company challenges. Even though some sources used in this introduction were also identified through the systematic search for sources, it was decided to exclude these more descriptive parts from the literature synthesis. This decision contributes to readability and comprehensibility of the work in hand. For this reason, the sources cited in the introduction do not show up in the synthesis matrix as introduced below.

2.6.1 Synthesis matrix

Following the suggestion of NCSU's Writing and Speaking Tutorial Services, the construction of a synthesis matrix helped to organize findings and drawing conclusions from the literature review. A synthesis matrix is a tool to facilitate

and structure the combination and synthesis of research findings as well as to identify gaps in the current state of knowledge (Ingram, Hussey, Tigani, & Hemmelgarn, 2006). The synthesis matrix was developed and used in two steps: In the first step, the included sources were examined and all important information, the study focus, main findings or themes identified were added to the matrix fields under specific keywords (themes). As the review of sources progressed, new sources were added and assigned to the identified themes or used to further expand the matrix. The matrix as shown below was printed and filled by hand when reading the included sources. These handwritten matrices were not transferred to Excel as this would have taken a considerable amount of time.

	Theme A	Theme B	Theme C	Theme D	Theme ...
Source 1	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>
Source 2	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>
Source ...	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>	<i>...interesting findings, summary, keywords...</i>

Figure 7 - Synthesis matrix step 1

In step two, the themes which appeared most frequently and those with most reference to my topic were identified and used as a basis for the thematic synthesis. Finally, an advanced matrix as overview of included sources, identified themes and frequency of discussion was created (Figure 8). Due to the deductive approach of reviewing the literature, most themes identified fit well to my research topic. As the research questions were already drafted before

starting the literature search and the search terms were closely based on the literature review problem formulation, appropriate literature sources were relatively easy to identify. Many of the selected original research studies are very subject related and close to my topic and research objectives.

			Literature Synthesis Matrix																			
Themes			a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	Other aspe					
<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> / </div>			the concept of competencies (2.6.2.1)																			
			competency movement																			
			behaviour/ intelligence																			
			performance / effectiveness																			
			human resources management																			
			competency identification and modeling (2.6.2.2)																			
			competency models, definition, benefits																			
			pitfalls in competency modeling / bad models																			
			generic competencies																			
			approaches to model development																			
participatory approach																						
competency modeling and implicit / tacit knowledge																						
purchasing and purchasing competencies (2.6.2.3)																						
purchasing paradigm shift, relevance and contribution																						
purchasing competencies: an introduction																						
performance and effectiveness focus																						
strategic- and technical-competencies focus																						
purchasing job type, profile and role focus																						
purchasing tasks and activity focus																						
purchasing training, education, professional development focus																						
industry specific / public sector view / regional view**																						
multiple criteria decision making																						
minorities																						
character																						
#	year	author(s)	Sources marked with X are cited in the synthesis Sources marked with O are not cited under the theme See paragraph 2.6.1 p. 58 for further information																			
1	1954	Flanagan	X	X	X				X													
2	1959	White		X																		
3	1971	Stilwell, Anderson																				
4	1972	Lundberg	X		X				O													
5	1973	McClelland	X	X	X	X																
6	1980	McClelland, Boyatzis	X	X	X	X																
7	1982	Boyatzis	X	X	X	X																
8	1983	McLagan	X	X	X	X																
9	1983	Shelton	X	X	X	X																

Figure 8 - Synthesis matrix step 2 (see also Annex 1)

It is worth noting that although the matrix was extremely useful in developing the synthesis, it needed to be used with caution. Not all authors and sources as listed in the matrix under one particular theme are also cited in the synthesis part(s) they have contributed to. Only those sources are cited in the synthesis parts which in the view of the researcher add to the topic and include meaningful, interesting or unusual statements. This means that even though many sources might be marked under a certain theme, only the most relevant ones would be used for developing the synthesis text. This is mostly the case

for more general themes, which might be covered by many authors, but only a few really add to the theme and are considered worth to be cited in the synthesis. For example, many authors are marked under the theme human resources management, but some of them are not mentioned in the corresponding synthesis text. This can be explained through the fact that many of those authors referred to human resources management in their works, maybe in the introduction, but then focused on a very special aspect and might therefore be cited elsewhere in the literature review (only). Also, not all themes identified in the included sources are covered by the synthesis, but only those who were prominently covered or those the researcher believed would add to reach the literature review objectives. Themes which are covered only by few sources and for this reason considered insignificant by the researcher were nevertheless kept in the matrix for the reason of completeness and to demonstrate how diverse the covered themes in the field of topics are. Summarized, all authors listed in the matrix will show up in the literature review text – but not with all their topics or aspects of their work.

2.6.2 Prominent themes

This literature review introduces competencies as a topic which spans across various scientific disciplines. By presenting the competency movement and by highlighting key streams in early research on the concept of competencies, it describes competency studies as emerging field which was soon adopted by the organizational function of human resources management (2.6.2.1).

Section 2.6.2.2 addresses competency models by giving an overview on major literature findings on model definition and benefits, pitfalls of model development and generic competencies. An excursion then briefly examines the DFS generic competency model against this backdrop. Also, the synthesis presents different approaches to model development and highlights sources that support the idea of model development in a participatory approach. Finally, sources on implicit knowledge consideration in competency modeling are discovered.

As one ever recurring theme in supply chain management literature, the evolvement of the purchasing function and its influence on the focus on purchasing competencies within organizations was identified. However, as an extensive review of the literature on the general relevance of purchasing in company environments would go beyond the scope of this study and literature review problem formulation, the discussion on purchasing relevance is presented based on the works of some early key authors and recent additions. In order to link the general discussion on purchasing relevance and competencies to the topic of the case study in hand, another excursion then discusses the purchasing function and its relevance at DFS Deutsche Flugsicherung GmbH.

Finally, a comprehensive synthesis on purchasing competency studies gives an overview on existing research in this main area of interest and identifies prominent topics and interesting aspects in the research history of this field (2.6.2.3).

Based on the findings of above review priorities, the paragraph finally answers the questions as defined in the literature review problem formulation (2.7).

2.6.2.1 The concept of competencies

a. The competency movement and competency based HRM

Many authors in the fields of psychology, adult education and business administration contributed to the still emerging literature base on competencies (Mulder, 2001). To understand the impact and advantages of the competency focus for today's business world, it is helpful to portray the work of key contributors to the topic, which is frequently discussed in competency literature.

The concept of competencies has its roots in the early 1950s, when US psychologist John C. Flanagan started testing methods to identify and measure reasons for successful performance and failure. Flanagan's work did not focus on technical or organizational aspects, but on human behaviour that led to desired or undesired outcomes. By introducing the so called critical incident technique (CIT), relevant *participant behaviour* was identified through direct observation and interviews (Flanagan, 1954). Since then, the CIT was used in various fields such as task and activity analyses, identifying organizational problems, market research and analysis of accident reports.

The aspect of participant behaviour also plays an important role in my study, where I observe participants in a late phase of data collection to revise the competency model which I developed earlier.

By claiming that the need for competence is one foundation of behaviour and intrinsic motivation (White, 1959) and by defining executive roles and competencies for job development programs (Lundberg, 1972), other early sources of psychology and education literature ported the competency term to areas of interest in the organizational context. Competencies were soon taken up by disciplines like business administration and human resources management (Markus, Cooper-Thomas, & Allpress, 2005). Harvard University professor David McClelland (1973) in a much-cited article claimed that standard intelligence tests are unsuitable for testing personnel for occupational aptitude or even for predicting job performance or success. He stated that it is rather a question of individual characteristics and competencies to identify high performers. In this context, McClelland (1973) considers competencies to be motives, traits and characteristics which are needed in order to perform individual *activities*. The view to define competencies for individual activities is shared by me and - as the thesis title indicates - finds expression in the definition of competency needs not in general, but per purchasing activity identified. According to McClelland, competencies of top performers can be identified through thematic analysis of behavioural event interviews (BEI). In 1980, McClelland capitalized on his findings and professionally applied the job competency assessment (JCA) methodology to develop a competency model for business managers, in which he linked generic competencies to job performance (Cooper, 2000; Kline, 1986). Since then, McClelland's

methodology of job competence assessment was regarded as an accurate approach to identify job performance and success. With McClelland's work, the so called competency movement was about to get going.

McClelland's (1973) above competency term was later picked up by his colleague Richard E. Boyatzis (1982) in his book "The Competent Manager: A Model for Effective Performance", which introduced competencies to identify top performers in company environments and thus significantly boosted the competency movement as well as competency based human resources management. Boyatzis (1982, p. 21) defined competencies as "*underlying characteristics of a person*" and focused on those motives, attributes, skills, roles and knowledge that sets certain employees apart from others and "*provide the basis for recruitment, selection, and development strategies that are effective and provide a high return on investment*". Through the above author's works, the crucial nature of competencies as a characteristic of high performers was starting to develop.

Patricia McLagan defined competencies as *an area* of knowledge or skill crucial to the production of key outputs (McLagan & McCullough, 1983) and described the concept of competencies as knowledge and skills for producing and delivering human resources outputs (McLagan, 1989).

McLagan and McCullough (1983) advanced the concept of competencies in the field of human resources development by building competency models from a practitioner perspective. With a focus on the identification of future challenges and competency modelling in iterative steps, McLagan provided a much cited and followed methodology to company competency modelling. Her approach to competencies as a process leading to mastery of skills was soon adopted and

applied in other contexts, for example competency based adult education (Shelton, 1983). Some aspects of McLagan's (1983) work such as the consideration of future competency needs and the element of iteration in the model development process were borrowed for the study in hand.

In later research, McLagan (1989) focused on organizational change and identified six change areas with high impact on business practices. As one success factor for managing this situation, she identified the need of employees to change and to further develop, which includes acquiring new competencies.

Mulder (2001) in his thoughts on competency development identifies various practical contexts in which the concept of competencies is used, for example

- *organizational strategy context*, where (organizational) core competencies are defined to contribute to the firm's success. Hamel and Prahalad (1989) focused on the benefits of core competencies (competencies of the company), which they describe as capabilities to provide unique functionality and competitive advantage in the business environment. The idea of core competencies was later picked up by Rothwell (2002) who states that core competencies are required by all employees of an organization and are therefore similar across jobs and functions, which means that core competences should reside at a company level rather than departments.
- *personnel management context*, where competency development forms the basis of human resources development measures (see 2.6.2.2).
- *professional education, training and development context* for boosting corporate training and establishing learning routes (see 2.6.2.3 n)

- *education and labour context* when it comes to curriculum development and secondary professional education (not further covered by this thesis)
- *professional development*, for example in competency evaluation and certification for certain professional groups

The context in which this case study investigates competencies is primarily personnel (human resources) management. To further illustrate the impact of competencies on the disciplines of human resources development and economics, it is important to understand how human resources departments used to work before the focus shifted to competencies.

For decades, personnel requirements for specific positions were identified solely by analyzing the job itself. It was not questioned what competencies a person needs to be successful in a job but only what tasks and activities a person would have. Today, as shown above, job situations, tasks and activities underlie a constant change and more and more job descriptions focus on outcomes and goals rather than activities for reaching them. Companies concentrating on jobs only were soon facing the problem of inflexible workforces which lack needed competencies to work on multiple interdisciplinary tasks and under changing circumstances.

In two groundbreaking articles Edward E. Lawler and Gerald E. Ledford challenged the prevailing belief that jobs should be the fundamental building blocks of any company. The authors stressed that in today's economies and under the changing nature of work and organizational pressure, companies should focus on competencies not jobs (Lawler, 1993; Lawler & Ledford, 1992). The competency-based approach, which shifts the focus from jobs towards individuals and their competencies (Lawler, 1993; Lucia & Lepsinger, 1999) is

argued to have strong implication for employee selection, career developments and pay systems and to leverage human capital more effectively compared to the job based approach.

Benefits of competency based human resources management are reported to reach from improved human resources processes, purposeful selection, promotion and succession planning and performance- and talent management to improvement of individual effectiveness (Berger & Berger, 2010; Lawler, 1993; Lawler & Ledford, 1992; Lucia & Lepsinger, 1999). Supporting the company's strategic objectives, innovation and better overall performance are among the most substantial benefits of competency based human resources management (Dubois & Rothwell, 2012; Lawler, 1993; Mulder, 2001). As Thompson et al. (1996) report, competencies help to "raise the bar" on employee performance when used for staffing, training and development, performance management and compensation decisions.

In an early work in the field of *purchasing* competency studies, Dion and Banting (1987) put individual employee performance in relation to selected competencies by answering the question which competencies are necessary for buyer effectiveness. Dubois (1993) in his much cited book "Competency based performance improvement: A strategy for organizational change" takes up this issue and introduces an approach to analyze and improve organizational performance. By presenting three organizational (single) case studies, the author shows examples on how successful the implementation of competency-based performance improvement programs can be.

Competencies can be used as a framework for integrating above mentioned human resources applications and aligning them to organizational goals.

Matching existing employee competencies to needed job competencies is one main statement of the competency based approach to human resources management. Dubois and Rothwell (2012) therefore suggest examining jobs not only in terms of tasks and activities performed but also in terms of competencies needed. My approach for developing a competency model incorporates this view and approaches the question of competency *needs* from the viewpoint of purchasing tasks and activities.

Especially in the light of organizational changes, competencies became much focused in human resources management. As a practitioner and purchasing professional in a changing business environment, I generally do appreciate the trend to focus on competencies. However, some negative effects of focusing generic and not function specific competencies will be analyzed further down.

Based on the works on competencies and presumed impact on individual and company performance of all the above cited authors, a major stream in competency literature covers the identification of competencies and *competency model* development (competency modeling), which will be discussed in the next paragraph.

2.6.2.2 Competency identification and modeling

As outlined above, job competencies are focused by human resource departments for various reasons. Most world class organizations have defined competencies to increase organizational performance (Coughlin, 1997). To capitalize on this trend, consulting companies and software developers are providing their customers various standard or company tailored systems of compiled competencies, so called competency models (Ennis, 2008). Companies deciding to follow the competency based approach to human resources management are likely to align all human resources measures to the idea of competencies (Mulder, 2001). Building a competency model is a prerequisite for doing this (Markus et al., 2005; Yu-Ting, 2008). Literature themes considered relevant for this thesis are the discussion on model benefits, pitfalls in competency model development, the role of generic competencies, different approaches to model development - especially modeling from scratch -, participatory approach to competency modeling as well as the consideration of implicit knowledge in the model development process.

b. Competency models, definition and benefits

Competency models are often described as sets of competencies, merged into descriptive tools, identifying requirements necessary to operate in specific roles (Ennis, 2008; Yu-Ting, 2008). They include attributes that are characteristic of individual jobs and they help identifying competences in order to measure and increase performance (Sinnott et al., 2002) and to support human resources measures (FAC-COTR, 2011; Yu-Ting, 2008). Competency models are even described as the holy grails of human resources activities, identifying sets of

attributes which are crucial for success (Ulrich, Zenger, & Smallwood, 2000). They are a way to define what is needed in terms of competencies to produce the results an organization desires and by this means “*should provide the North Star*” (Intagliata, Ulrich, & Smallwood, 2000, p. 3). Competency models can function as a tool to standardize language and communication among different stakeholders when addressing job requirements and to guide the workforce into the desired directions (Mulder, 2001; Rodriguez et al., 2002).

Rodriguez et al. (2002, p. 311) in their view on the US public sector underline that a common language in competencies helps to reduce “*costs of developing independent and often redundant*” models within comparable organizations and promote a common understanding among the stakeholders of competency models. Within these aims, the authors describe their MOSAIC methodology as an approach to competency modeling which emphasizes job-group analysis, broadly defined tasks and common competencies over single job analyses.

Competency models can help creating job awareness (Brown, 2006). They facilitate examination of competencies that individuals possess or need to acquire. Competency models are therefore helpful to develop human resources measures and thus can be the foundation for growing intellectual capital. Mirabile (1997) further remarks that developing competency models can be the basis for defining job profiles and serve as a tool for evaluating competencies.

Aligning workforce education with company needs and promoting transparency and mobility for individuals (for example career progression opportunities) are additional benefits of competency models. Ennis (2008) confirms that human resources, management and employees can work in unison to meet the goals of the organization as soon as a *job position specific* competency model has

been developed. Furthermore, recruiting the right individuals, development of career plans and training maps support company- and individual goals (Ennis, 2008). Also, competency models can be the groundwork for guiding professional development programs in companies and assist trainers and instructors when setting up training programs and curricula (Rothwell & Wellins, 2004).

The widespread use of competency models was already reported in a study from Schoonover et al. (2000), which revealed that companies use competences for hiring, job-descriptions, training, performance-management, development-planning and definition of career-pathways. From an employee perspective, competency models can be useful for planning job advancements or career transitions (Ennis, 2008). They ensure that employees “*understand what it takes to move up or over in the organization*” (Lucia & Lepsinger, 1999, p. 1). Besides, competency models can attract employees as well as organizations with an interest in achieving (learning) objectives and lifelong learning (Lawler, 1993; Thompson et al., 1996), especially in organizations where cross-departmental career opportunities are given. This is an important aspect in times when job rotation is considered a management technique for on-the-job training and motivation (Ortega, 2001).

Fogg (2006) from a strategic management perspective states that competency models should be developed for each job and occupational function. However, many organizations fail to exploit the potential offered by competency models.

I appreciate the statements of Fogg (2006) and Ennis (2008) who demand position- or function-specific identification of competency requirements and seek to develop a competency model for a specific professional group at DFS.

c. Not every competency model is beneficial

Intagliata et al. (2000) identified reasons why models which have been developed fail to help in reaching the desired goals. Firstly, competency models quite often define competencies, but lack the explanation of *why* people should behave in a certain manner and *what* the *results* of such behaviour should be. I understand from this critique that most models define competency needs, but many of them lack to inform for which activities and for what reason (for example to fulfill a task or role) people should acquire these competencies. According to the authors, this often occurs when competency models are developed with a cost focus. These less rigorous approaches to competency modelling might involve simply “*rank-order the relative importance of a pre-determined set of generic competencies*” or “*picking an already developed competency model because it looks complete*” (Intagliata et al., 2000, p. 6). As shown later in more detail, the latter is also known as “borrowed” (Rothwell & Lindholm, 1999) or “overlay” (Dubois, 1993) approach to competency modelling.

Secondly, competency models fail because the competencies are too generic. This can happen when only non-specific sources like books, generic competency catalogues or off-the-shelf example models are used for model building or when the modelling process focuses on the identification of fundamental (generic) behaviour only (Intagliata et al., 2000).

Thirdly, competency models often are reported to be not future-related, but only describe what was important in the past. Furthermore, many models are not updated based on company evolution, growth, trends or change.

Brown (2006) adds that competency models should not be built of too many items and suggests a total of approximately 14 competencies per specific job. He also criticizes that many competency models include too complex or vague items, which are actually job tasks or activities, such as project management.

Intagliata et al. (2000) add that many companies fail to benefit from their competency models because once they are developed, they are poorly *applied*. According to the authors, this might happen when model application is considered too time consuming or complicated due to organizational politics or potential resistance against the model. The authors argue that developing the model is not enough, but it “*needs to be applied aggressively, creatively and comprehensively*” (Intagliata et al., 2000, p. 8).

Also, in case when certain stakeholders are not sufficiently involved in the modelling process, model application will suffer (Intagliata et al., 2000). Models might fail because model development happens within human resources department or consulting companies, but without senior executive involvement. “*As a result, the model may get executive approval and blessing but not executive use*” (Intagliata et al., 2000, p. 8). This last argument is reasonable, but could also be called contradictory as the authors criticize an extensive participatory approach for model development (see further down).

As described in Chapter 3, my approach to develop a competency model considers the described pitfalls and aims to fully benefit from the advantages of competency application in company environments. The model seeks to avoid vague contents and thus provides a breakdown from a task and activity level to individual competencies. Moreover, the modeling process follows a participatory approach to raise model quality as well as acceptance with stakeholders.

However, from all the above critique, especially the aspect of generic competencies and generic models is frequently discussed in literature and will be outlined in the next section.

d. Generic competencies

After 30 years of research on competencies in various fields, a trend to focus on generic competencies as main output of competency studies can be noticed.

Ennis (2008) in her view on the competency literature and a general competency model framework distinguishes personal effectiveness competencies, academic competencies and workplace competencies from competencies which can be broadly applied to industries or occupations and include such generic attributes like interpersonal, initiative, reading and writing, teamwork or creative thinking. In their book "*Competence at work: Models for superior performance*" Spencer and Spencer (1993) describe how to conduct job competency assessment studies and present generic competency models for various job groups. Goleman (2000) in his book argues that emotional intelligence - which he defines as specific set of competencies - is the most important factor in job performance. He also observes employers' emphasis on generic skills over technical and context-specific skills.

The focus on generic competencies is described by Mulder, Weigel, and Collins (2006) as one of the three traditional approaches to the concept of competencies. The two other approaches are described as the cognitive approach and the behaviourist approach to competencies.

The *generic* approach aims at identifying common abilities which can be applied to different professional groups. Gonczi, Curtain, Hager, Hallard, and Harrison

(1995) as cited by Mulder, Weigel and Collins (2006) and Hager (1998) as cited by Mulder et al. (2006) remark that generic competencies are sensitive to a particular workplace context and context changes. Often also referred to as soft skills, generic competencies are non-technical and environment specific (Conrad, 1999). The *behaviourist* approach focuses on identifying competencies which are vital for successful job performance and can be acquired through employee training and development. Mulder et al. (2006) add that although the behaviourist approach originated from McClelland's seminal work as described earlier, it has also been used widely outside the US. Finally, the so called *cognitive* approach refers to the more intellectual abilities like intelligence or mental resources applied by individuals to perform well in specific contexts (Weinert, 2001 as cited by Mulder et al., 2006).

Comments and critique on the generic approach and generic competency models frequently can be found in literature. Markus et al. (2005, p. 118) in their research on the use of competency models in New Zealand confirm that competency models which are designed for selection and educational purposes *"usually [should] describe technical competencies in terms of their antecedent skills and knowledge, at a detailed level."* Regarding the use of generic competency models, Bowden, Hart, King, Trigwell, and Watts (2000) in their attempt to develop strategies to support the development of relevant generic capabilities of Australian university graduates confirm the above statement of Hager (1998) and claim that generic competencies can only be defined within a certain context. This context can be a professional discipline or individual job. Tranter and Warn (2003, p. 2) in their interesting study explored to which extent generic competencies were developed across various streams of university

degrees and confirm that “*generic competencies may possess little shared meaning when divorced from a particular context*”. The positive effects of a competency model as outlined earlier cannot be exploited when generic competencies is the only benchmark.

Markus et al. (2005) report that in the private as well as in the public sector, organizations tend to emphasize generic competencies over specific technical or professional competencies. The authors rate this current approach to competencies as “*confounded by over-simplified*” generic models and also suggest a research based approach to competency model development (Markus et al., 2005, p. 125). In their work on leadership competencies, Intagliata et al. (2000, p. 7) criticize models with only generic competencies and give examples how something like “*this can happen*”.

The critique on generic models and especially the suggestion to follow a research-based approach to competency identification encourage me to bring this research forward.

Excursion 1: DFS generic competency model

It appears that DFS did not fully benefit from the potential advantages of competency modelling, which will briefly be illustrated on the example of DFS purchasing department.

Purchasing professionals at DFS are hired and evaluated according to the standards of an existing DFS competency model. The model is a generic one and universally valid for all DFS employees. When applying the above typology as introduced by Mulder et al. (2006), the generic approach to competency modeling was applied at DFS.

I criticize this for two reasons. Firstly, universal validity means that the model only slightly distinguishes between the generic competencies required by purchasing professionals and other job groups, for example software developers. Distinction only happens in terms of a scaled priority of competencies (not important, important, very important), for example in performance reviews. In consequence, according to the DFS model every single DFS employee virtually needs the same generic competencies to receive good performance evaluation. Only little attention is given to the individual employee's actual working situation and environment. Secondly, functional or job-related competencies necessary for explicitly defined job tasks and activities are not part of the DFS competency model.

In consequence, purchasing professionals working in completely different job positions with different tasks and activities have an almost identical job description with only elementary functional or technical competencies described. This results in the very negative effect that neither employees nor management can find themselves in the model or tools which are based on it, for example performance appraisal sheets. Consequently, the model is barely accepted, not applied for many human resources measures and decisions and sometimes not even known by the workforce. The sole focus on generic competencies puts in question the model's usefulness and ignores the potential benefits it could bring the organization.

The above critique on the DFS competency model has its roots in the generic approach, which was obviously applied when developing the model. The approach to competency modeling applied in this research study seeks to avoid concentration on generic competencies only.

e. Approaches to model development

Basically, setting up a competency model can be achieved by defining a simple top list of desirable competencies (Lucia & Lepsinger, 1999; Markus et al., 2005). However, some put a lot of more effort in terms of time and money in the process of competency identification. The practice and procedures of competency modeling was identified as one frequently covered topic in the surveyed literature. Before presenting in detail my approach to competency modelling in Chapter 3, this paragraph will review some major approaches, methods and challenges to competency modelling.

Different approaches to develop competency models are described in literature and many authors in the field picked up, enhanced, and further developed methodologies developed by early key contributors to the field. Application and development of approaches and methods strongly depend on individual scientific or practical background and situation. Basically, there are two main options when it comes to competency modelling: model development by *borrowing or tailoring* an existing model (Dubois, 1993; Rothwell & Lindholm, 1999) or model development *from scratch* (Lucia & Lepsinger, 1999).

Rothwell and Lindholm (1999) in their review of selected literature sources describe how competency identification and modeling evolved in US based companies. The authors further discuss what government efforts have been influenced by the competency movement and reflect on how competency models will be applied in the future. Finally, the authors identify three challenges that must be faced by future practitioners developing a competency model: 1. the ambiguity of terms and definitions; 2. focus on future and not only past-oriented competencies; and 3. finding a time-rigor trade off.

Organizations seeking a quick and budget friendly way of competency modeling might want to take over (borrow) an already existing competency model. Borrowing, however, is not even the right term for it – as mostly taking over an off the shelf or existing model is not for free.

Cooper (2000) in his text book on effective competency modeling confirms that companies today may be willing to accept existing third party models for reasons such as lacking expertise to develop an individual model, budget or capacity, but states that most companies today prefer to develop custom models. The author explains that even though there might be a group of competencies common for all organizational positions, *position specific competencies* need to be explore through setting up a model from scratch. He points out that for this reason there will be economies of scale when developing models for multiple positions in one company. Cooper (2000) further underlines that there are many sources of competency information, but not all of them need to be used in order to develop a competency model. However, he strongly suggests selecting a modeling approach and corresponding methods by design, and not by default. According to Cooper (2000), sources of competency information can be for example statutes and regulations, organizational vision / mission statements, position- and process-documentation, job related documents like job descriptions, contracts or performance plans, or data gained from interviews with customers, suppliers, employees or supervisors.

My approach to competency modeling takes into account many suggestions of Cooper (2000). An individual research design and methodology was developed and existing competency information from selected sources was explored. Especially the recommendation to involve *outsiders* in the competency

identification process very much corresponds to my intention to incorporate various viewpoints on competency needs in the modeling process. My approach, research design and methodology are described in Chapter 3.

Today, human resources consultants as well as software developers offer *one size fits all* competency models, which are easy to implement. If lucky, the adopting company has spent its money for a theoretically well-fitting competency model which realizes the advantages as described above. However, this approach to competency modeling is criticized for a number of reasons. Firstly, the borrowed model often consists of generic competencies only and – as it has to fit to a variety of companies - is probably imprecise when defining specific competency needs of specific job groups or individual positions in the adopting company. As Dubois (1993) states, especially technical competencies are most likely defined blurry, imprecise or are completely absent. Moreover, as stakeholders of the adopting company are typically not involved in the model creation process, the borrowed model might not fit in company language and culture, be not accepted by its users and for this reason probably remains largely ignored. One could argue that a generic model might serve as a starting point for more comprehensive efforts in competency identification. Otherwise, building on a generic model might set wrong paths for people seeking to identify competencies. However, I argue even if generic models might be a source of competency information, its contents should be at least put in question when using it as source of competency information.

To face the obvious disadvantages of the above described method; the approach to *tailoring* an existing model to individual organizational needs is described in literature. Tailoring is achieved by bringing in some in-house

methodology when modifying an existing model (Lucia & Lepsinger, 1999; Rothwell & Lindholm, 1999). The success of tailored models strongly depends on the effort and methodology which is applied to them during the modification process. Potential disadvantages stay the same as with untailored models in case of poor specific organizational input and customization. When done thoroughly, tailoring an existing model might save time and money compared to the approach of creating a model from scratch (Lucia & Lepsinger, 1999). Anyway, extensive tailoring means substantial effort in terms of time, money and manpower which, in many cases, comes close to the effort needed when starting competency modelling from scratch.

Competency modelling *from scratch* was described in detail by Lucia and Lepsinger (1999) in their much cited book “The Art and Science of Competency Models – Pinpointing Critical Success Factors in Organizations”. However, a large number of authors before and after have defined their own methodologies and methods to competency modelling. Mansfield (1996) for example distinguishes the *single-job approach* and the *one-size-fits-all approach* to competency modeling. The author remarks that both approaches have limitations when a model is needed for multiple jobs and he describes requirements of a multiple-job approach to competency model development as well as necessary competencies to implement such an approach. Some companies today refuse to develop competency models for individual job positions or functions. They either chose an off the shelf model or develop an organization-wide generic competency model. Others decide to invest time and money to develop job specific, individual models from scratch (Lucia & Lepsinger, 1999; Mansfield, 1996). When choosing the latter way, one common

approach among practitioners is the involvement of experts in the subject under investigation to collect data on critical competencies (Martinez, 2008). As described in detail further down, expert involvement was implemented as one essential aspect when developing the competency model for DFS purchasing professionals.

Brown (2006) further declares that competency modeling requires an adequate competency development methodology, such as studying exemplary performers or conducting a job analysis. However, the majority of researchers in the field of competency mapping use a mixed method approach to model development (Lucia & Lepsinger, 1999).

Surveys. Typically, questionnaires are used to collect quantitative data from larger parts of the target population. Questions may focus on the perceived importance and / or frequency of use of different competencies. Surveys can be structured more or less open, for example with predefined competencies to rate or open ended questions in written form. As many authors confirm, the likert scale rating system is commonly used in questionnaires seeking to identify competencies (Dubois, 1993; Lucia & Lepsinger, 1999; Saunders et al., 2009). According to Cook and Bernthal (1998), 61% of organizations studying competencies make use of surveys. My study incorporates surveys among purchasing professionals and uses likert scales as well as a custom designed diagram for free text entry, which will be introduced further down.

Focus groups. Group discussions and Brainstorming are often used to collect mostly qualitative data of participants in small groups. The degree of interaction and moderation depends on the individual methods applied. Focus group participants can be exemplary performers (Lucia & Lepsinger, 1999), members

of management or other subject matter experts (Dubois, 1993; Mansfield, 2005). Cook and Bernthal (1998) claim that 68% of organizations studying competencies use this method for collecting data on competencies. However, Intagliata et al. (2000, p. 6) adds for consideration that even when using focus group discussions for tracking competencies, "*their value ultimately depends on the depth of the insight and wisdom of the participants*". My study adopts the idea of focus group support by integrating internal knowledge carriers in different stages of the model development and verification process.

Interviews. Using interviews to identify competencies usually means asking questions to predefined study participants in more or less open style of questioning. Frequently, exemplary performers or other persons with deep knowledge on competency needs (such as customers of the target population) are chosen as interview partners (Lucia & Lepsinger, 1999). Traditionally, this method is referred to as behavioural event interviews (BEI) (McClelland, 1973) or critical event interviews (CEI), which is based on Flanagan's critical incident technique (Boyatzis, 1982; Mansfield, 2005). According to Cook and Bernthal (1998), 80% of organizations studying competencies do this by using interviews. My study uses qualitative interview data as one form of evidence in the model development process as well.

Performance observation. Observation of participants can be applied in different situations with the goal of coding of competencies, for example as analyzed from critical task observation. Observations are often described as impractical in company environments (Lucia & Lepsinger, 1999; Mansfield, 2005) and are therefore only rarely conducted. However, observations as a method for verifying model contents and identifying implicit participant knowledge on

competency needs was used in the DFS purchasing competency study in hand and will be described in more detail further down.

Whatever methods researchers or organizations chose for collecting competency data, their decisions will be influenced by the actual situation in the research environment and possible challenges when planning or conducting competency studies. These might include the need to balance available resources like time, money or manpower against scientific rigor in the modelling process due to limited resources. Also, resistance or ignorance of potential participants, the fear of changes or extra effort might influence the choice of methods. A lack of management support, changes in management structure during the modelling process or changed circumstances in the business environment could also force researchers to rethink the chosen approach to competency modelling. However, it is considered that many of the mentioned problems have their roots in poor communication of study objectives and impact (Lucia & Lepsinger, 1999).

Depending on the selected approach as well as methods chosen to collect competency data, many authors describe multi step processes for building competency models. Lucia and Lepsinger (1999) for instance suggest starting with addressing some basic issues and laying a solid foundation for the modelling project. They suggest that one should initially decide

- the objectives and scope: Why develop a competency model?, who is the target population?, what approach to apply?, who will do the research?

- the implementation goals and standards: What are we going to use the model for? When can we consider the project successful?
- the action plan: What tasks are to be done? Who does what and in what timeframe? What resources are needed?
- what exemplary performance means for the job in focus?

When deciding to start model building from scratch, Lucia and Lepsinger (1999) suggest four steps for collecting and analyzing data: a. define the methodology to use for data collection, b. conduct interviews or focus groups, c. perform job observations, d. data analysis and model development. The next steps would then be *model validation* and implementation.

Dalton (1997) observed that many organizations are pretending to develop a competency model only by setting up lists of useful competencies. As an alternative, he proposes a five step approach to competency modelling: a. specification of *individual job or position* to analyze, b. identify current and future business challenges, c. applying critical incident technique as introduced by Flanagan (1954), d. identification of vital competencies through content analysis, e. model validation. Interestingly, Dalton, who also suggests avoiding competency modeling as the sole source for assessment of competency needs, does not focus on superior performers when conducting CIT interviews. Dalton's (1997) above critique seems to be true for the existing DFS approach to introduce company-wide competencies as described earlier. His suggestion to identify individual job positions as part of the modeling process confirms my view that identifying competencies for specific corporate functions is necessary.

Spencer and Spencer (1993) suggest the following steps in competency modeling: a. definition of performance criteria and samples; b. data collection; c. data analysis; d. model building, implementation and application.

Model validation. As shown above, some authors in the field of competency modelling suggest that models once developed should be reviewed in terms of validity and reliability. Model validation is mostly described as seeking to find out whether the identified competencies are really those that are needed for performing as expected and how precisely specific competency needs are portrayed by the model. Again, lots of different approaches to model validation are described in literature. Lucia and Lepsinger (1999) state that depending on the intended use of the competency model, the importance of model validation varies. For example with models only used for training and development purposes, face validity among those doing the job is described as sufficient as this supports model acceptance. However, for models intended for a more comprehensive application, validation might also include additional data collection and analysis. According to Dubois (1993) establishing model validity can be achieved through replication of the original research or through collecting additional data such as expert opinions revealed through surveys or focus groups or competency tests. From the above author's remarks, model validation appears to be more important in cases where one-size-fits-all or off-the-shelf or tailored modelling approaches were chosen.

From my point of view, the need to validate a developed competency model even rises when an approach to modeling is chosen that incorporates collecting data from only one source or perspective. Also, I argue the need to model validation rises when a from-scratch model is not developed in a participatory

approach. Both above circumstances might higher the need for additional proves that the developed model is good and reliable.

However, I argue the frequently used term model validation might be misleading or even inappropriate when modeling happens as part of a scientific research study. A discussion why the term model validation might be too strong for use as part of my study is presented in Chapter 3.4.3. It outlines why I stepped back from the term validation and used the approach of *model verification* instead. I have decided to add the aspect of model verification in terms of collecting additional observation data and to identify implicit participant knowledge on competency needs. However, even if verified, I argue a competency model should be revised and updated on a regular basis.

f. Participatory approach

Approaches to include different key stakeholders in the process of competency model development were described as beneficial by various authors (Dubois, 1993; Harchik et al., 2001). Harchik et al. (2001) for example evaluated a participatory model of staff training for a specific target population and found the model was an effective one.

Benefits of a participatory approach are usually described as a high degree of model acceptance and validity. High participation levels can be achieved through the inclusion of various stakeholders in different steps, phases or iterations of data collection or verification in the model development process. Participation can happen through generation of original, additional (future) data, reviewing existent data, synthesizing data, making sense of cryptic data, or prioritizing data. Ennis (2008, p. 20) confirms that “*by having the entire*

organization involved in the development of competency models [...], there will be an organizational expectation of what makes the company succeed”.

According to Dubois (1993), key stakeholders to include are those parties most affected by the model, for example human resources, management and internal customers.

As mentioned earlier, Intagliata et al. (2000) in their article on leadership competencies try to identify why competency models fail in practice. The authors explain that many models focus more on behavior than on results and therefore claim the *star performer* approach in which the best performer’s competencies are considered the benchmark as the strongest approach to develop competency models. Saying this, they also criticise alternate approaches like the already described borrow and tailor approach. However, the authors also feel that the approach to let other stakeholders *participate* in model development (like in focus groups or expert panels) is not equally rigorous. The authors claim that the value of such models depends on “*the depth of insight and wisdom*” of the participants and their success is highly variable (Intagliata et al., 2000, p. 6). The model might find acceptance by those participating in the development process but, according to the authors, “*credibility with line managers and employees*” can only be achieved when demonstrating a link between model contents and organizational goals (success) (Intagliata et al., 2000, p. 6).

g. Competency modelling and implicit knowledge

The literature base on knowledge management is huge and its application as an approach for identifying, storing, using and retrieving different kinds of knowledge to improve organizational performance has emerged. Authors in the field tend to use the phrase *tacit knowledge* or *implicit knowledge* as knowledge which is uncodified and elusive. It is described as knowledge that people may not be aware of, or knowledge that people do not want to make explicit for various reasons (Stenmark, 2001). However, I have stated earlier that for the scope of my study, non-explicit knowledge is defined as implicit knowledge, which can be codified through identification as competencies in the modelling process.

Even though the general art and science of competency modelling is well explored (Lucia & Lepsinger, 1999), approaching the topic from a knowledge management perspective raises new issues. The knowledge term is used in the majority of competency definitions, but authors in the fields of competency modelling rarely distinguish between explicit, implicit or tacit knowledge. Data collection for competency modelling may involve methods to acquire different types of knowledge from the target population. Explicit information such as codified, formalized and expressible knowledge easily finds its way into competency models, but as this thesis reveals, competency models which are solely built of explicit information might be incomplete.

Lucia and Lepsinger (1999, p. 78) propose direct observation of incumbents to cross check interview data:

What people say they do and what they actually do sometimes differ, as they may describe their behaviour in terms of some ideal or expected response. Additionally, people may be less aware of the components or motivations behind behaviours that are based on good practice or experience and will therefore have difficulty describing them.

However, when it comes to identifying competencies as part of research studies, participant observations and the identifying implicit knowledge as defined above are rarely described as suitable methods. Interviews, focus groups, surveys and the analysis of internal documents and generic databases are reported to be the most applied methods (Cook & Bernthal, 1998). As stated further down in more detail, one main reason for refraining from doing observations is the critique that observed persons might act differently when knowing they are observed. Lucia and Lepsinger (1999, p. 78) confirm that *the mere presence of the observer changes the environment and the behaviour of the person being observed*". This criticism seems justified, as Lucia and Lepsinger (1999) propose one-on-one observations for a full or half day. It is easy to imagine that in a business environment with small individual offices or cubicles, observation results are likely to be influenced by above effects. Besides, participant observations might be rated as very disturbing for the observed persons and for this reason be excluded as data collection or validation methods. From my point of view, the success of observations also strongly depends on the participant's trust in and identification with the study and its goals and the relation between observer and participants.

A rare example of research focusing on purchasing professionals' implicit knowledge is provided by Giunipero, Dawley, and Anthony (1999), who

conducted a survey of purchasing managers to explore to what extent tacit knowledge is used when making purchasing decisions. The authors found out that both kinds of knowledge, implicit and explicit, were used in equal amounts by purchasing professionals when making buying decisions. Based on these results, the authors imply that purchasing managers use tacit knowledge to augment explicit data or knowledge before deciding. The results were true for all subgroupings of the target population. There is an implication of the above for my case study. The results show that implicit knowledge *is* existent and used by purchasing managers in a certain context when making buying decisions, so there might be implicit knowledge regarding *competency needs* as well. When implicit knowledge is existent and used by purchasing professionals, the question is if it also plays a role when it comes to the identification of competency needs, for example when purchasing professionals have to state their competency needs in a questionnaire. As the competency model in this study is built from the data (knowledge) of purchasing professionals, it is considered important to reveal their implicit knowledge on competency needs as well.

As described in Chapter 3, one of the outcomes of this thematic synthesis of the literature is that I will apply the method of participant observations in the company environment DFS to verify the developed model and to explore implicit participant knowledge. In terms of competency study design, I seek to find out whether it is really worth the extensive effort and difficulties and also whether it brings important insights and additional data to verify the model as built from collected explicit knowledge. I also consider this aspect important from a practitioner point of view as at DFS purchasing department, I frequently come

across the situation that people find it difficult to explain their tasks, activities and also necessary purchasing competencies.

I acknowledge the criticism and concerns about the observation method and agree that observations can only bring valuable insights in case the above described effects are eliminated. In my study, I argue that the possible drawbacks of the method were at least minimized. My observations were conducted during daily business times and normal working situations in purchasing department. The role of me as the researcher was diverse: at some observations, my role was the one of an observer only, in other events my role was the one of an (observing) employee and purchasing professional. It was therefore often possible to observe participant behaviour without being regarded as observer or researcher. Even though colleagues at DFS purchasing department were informed about the intended study goals and methods, most probably nobody felt observed in day to day business situations, for example when I attended business meetings, presentations, team meetings, training sessions or contract negotiations. Consequently, conducting observations did not influence nor disturb participants and thus support the goal to collect high quality data and to comply with management demands. Besides, I am an appreciated member of the purchasing team, and through discussions and information I have put in lots of effort to create trust among the study participants. The method of participant observations as part of my study will be described in more detail in Part C.

After having reviewed the literature on competencies and competency modelling in general, the next sections will briefly explore the purchasing function and its

evolution in the organizational context before reviewing the knowledge base on competencies and competency modelling in the profession of purchasing.

2.6.2.3 Purchasing and purchasing competencies

We have seen earlier that from the perspective of human resources management, employee competencies are considered as an important factor for the firm's performance and success. However, the competency needs for professionals in *purchasing* were of low interest for practitioners as well as academicians for a long time (Feisel, Hartmann, & Schober, 2007). The reason for this might be that in the organizational context, the purchasing function was usually regarded as a clerical, paper pushing function adding only little value and not contributing to company success. The fact that the role of purchasing was not valued by management and stakeholders was a universal phenomenon and not specific to certain industry sectors (Moorhouse, 2006).

h. Purchasing paradigm shift, relevance and contribution

The debate on purchasing competency requirements has gained momentum since the evolution of the purchasing function and the associated paradigm shift. Kraljic (1984) as one early key author in the field of purchasing evolution influenced the debate by arguing that purchasing should be considered as a strategic business function. In today's globalized business environment of highly competitive markets, it is vital for companies to have a competitive cost basis. As purchasing performs many value adding activities such as supplier identification, -selection, -evaluation and –development, market research, negotiation and contracting, its function today is considered a vital link to company's performance and success (Kraljic, 1983, 1984). Purchasing strategies, activities and competencies are reported to have significant positive impact on the firm's overall performance (Chen, Paulraj, & Lado 2004; Kwiatkowski, 2007).

Worldwide natural resource crises, the upcoming global competition and world recession strengthened the purchasing profile and also helped to shift its position from a more operational and support role to a strategic key function within many companies (Espich, 2004; Humphreys, Mclvor, & McAleer, 1998). Consequently, with the changing role and expectations on the purchasing function, the responsibilities and tasks of purchasing professionals shifted as well (Pechek, 2003). This evolution of the professional discipline is referred to as paradigm shift in the view of the purchasing function.

It is a very common statement by authors in the academic field of purchasing competency development that this change of paradigm not only affected the role and responsibilities of the purchasing function, but also the qualification- and

skill requirements on its professionals (Giunipero, Denslow, & Eltantawy, 2005; Giunipero, Handfield, & Eltantawy, 2006; Giunipero & Percy, 2000; Mulder, Wesselink, & Bruijstens, 2005; Trautman, 2008). To meet the increased requirements of management and stakeholders, decision making in purchasing has become more knowledge- and competence-driven. As a consequence, the question what competencies make a good purchasing professional was justifiably paid much more attention during the last two decades.

Due to the special status of some European ANSPs as public authorities or at least authority-like forms of enterprises in oligopolistic or monopolistic markets, it is a debatable question whether the reported paradigm shift in purchasing is a universal phenomenon and transferable to the purchasing function of the ANSP business as well. The literature review revealed that no specific research was done to verify above statements for the ANSP business. However, it was identified in the introduction that the described global business changes also apply to the ANSP business in general and to DFS in specific. I also already pointed at the emergence of competencies and competency modelling as one management tool as a result. It will now be interesting to see in more detail what makes purchasing so important to the organization and whether purchasing is even of strategic relevance at DFS.

The increasing importance of the purchasing function to support a company's strategic market positioning and enhancement of overall success is rarely put in question today (Carter & Narasimhan, 1996; Fröhlich-Glantschnig, 2005; Large, 2006). Consequently, it is no surprise that the topic has not only found its home in the academic discipline of economics but emerged and continued to gain in significance in research and literature over the past three decades.

The discussion whether the purchasing function is of *strategic* relevance for a company is rather theoretic and discussed controversially. The various views expressed are strongly influenced by the question that asks how *strategically relevant* is defined. Some authors argue that the strategic relevance of purchasing is nothing more than the fact that some own *specific strategies* may be followed by the purchasing function (purchasing strategy). Others see the strategic relevance of purchasing in its role in supporting the strategies of other functions and the corporate strategy as a whole. Many experts even argue that the purchasing *is* of strategic relevance to the company (Ellram & Carr, 1994). However, purchasing competencies are confirmed to have significant positive impact on the overall performance of the firm (Das & Narasimhan, 2000).

Kwiatkowski (2007) reflected on the question of whether purchasing creates a strategic impact by discussing different theories concerning potential strategic purchasing relevance. He provides a selection of factors determining strategic relevance of the purchasing function as synthesized from a literature review. He also remarks on the general potential of purchasing to be a strategic relevant function. Kwiatkowski's (2007) opinion that the purchasing function is not of principal strategic value is an important insight, but it may be noted that a certain level of sophistication needs to be reached and that purchasing needs to "*exploit its potential sources to actively contribute to a firm's sustainable competitive advantage and therefore to its overall performance*" (Kwiatkowski, 2007, p. 29). Assumed that purchasing is of strategic relevance for an organization and purchasing competencies are crucial for purchasing performance, it is obvious that the competencies of purchasing professionals should receive special attention. The next paragraph illustrates in an excursion how DFS purchasing

department situates itself within the organization and whether it operates on a strategic level.

Excursion 2: Purchasing relevance at DFS Deutsche Flugsicherung GmbH

DFS has a mostly centralized purchasing department with approximately 40 purchasing professionals. Within purchasing there exist specialized sub departments and teams for procurement of ATC, communication, navigation and surveillance systems and technology, IT systems, all sorts of external services, international and cooperative purchasing, construction and architecture, or facility management to name just a few. With a purchasing volume of more than 200 million Euros per year, DFS purchasing department performs various value adding activities such as supplier identification, -selection, -development and -evaluation, negotiation, contracting, market research and ensuring compliance with national and European public procurement law. The factors indicating strategic purchasing relevance as worked out by Kwiatkowski (2007) will now be examined in relation to the situation of DFS purchasing department.

DFS purchasing department has overall responsibilities for all corporate purchasing activities and is in charge of delivering relevant information to top management for consideration in monthly, quarterly and annual reports as well as top level decisions. It hereby acts as an equal contributor to other DFS functions. Its direct reporting line to top management ensures high visibility in the organization. Purchasing is equipped with independent powers, which are codified and universally valid throughout DFS. Proactive interactions with various functional areas as well as participation in cross functional teams

underlines the status of purchasing as an independent and strategic player within the company. As confirmed by many customer representatives in interviews, the perception of purchasing within DFS company is the one of a professional performer and major input contributor. Its collaborative relationship to key suppliers as well as special knowledge of buying markets and public purchasing regulations highlights the important role of purchasing at DFS. Besides, purchasing at DFS is organized with a high level of automation and paperless processes, such as electronic buying systems and supported with special software applications. Its high impact on strategic decisions regarding key suppliers speaks for DFS purchasing function's high level of strategic relevance. Finally, large parts of DFS purchasing staff is highly qualified, motivated and equipped with deep knowledge of the supply chain, purchasing, legal as well as technical topics.

As we can see above, DFS purchasing department can be evaluated as department with strategic relevance. Of course, this does not mean that this view is acknowledged by every stakeholder at DFS. It will be interesting to see how the arguments for strategic relevance will be underlined or weakened through statements of stakeholders regarding purchasing professional competencies during data collection phase. As a department with strategic relevance, the market challenges as described above as well as expectations of purchasing customers and management will keep purchasing department and its staff busy at a very high level.

Purchasing professionals at DFS face many different and complicated tasks and challenges as the field of activity varies from buying goods and services in very different and unique markets to the conclusion of frame agreements or the

drafting and negotiation of purchasing cooperation agreements, provision of customer support and advice in purchasing processes and legal assistance, to name just a few. Another important aspect is the fact that DFS is subject to the conditions of public procurement, which means buyers have to deal with the regulations of national and European public tendering and special requirements regarding transparency and compliance. The raised focus on cost effectiveness of air navigation (Eurocontrol, 2010) underlines the role of purchasing as strategic player in the company environment. DFS purchasing department as service provider feels highly committed on supporting the various DFS functions in reaching their goals. This is also reflected in the particular vision statements, which refer to the special focus on competencies in several ways.

Purchasing department's vision statement

We are a competent and reliable partner, service provider and manager of the purchasing process in the interest of the company.

Purchasing executive's vision statement

Based on a common value system we shall actively pursue our mission. In doing so, we are focusing our competencies and consider it vital to share the same goals and objectives when looking after staff, customers and stakeholders.

It becomes evident that the purchasing paradigm shift happened at DFS Deutsche Flugsicherung GmbH. This is important information as especially considering the critique on DFS generic competency model, it helps justifying more substantial and advanced competency studies at DFS purchasing department.

i. Purchasing competencies: an introduction

The literature reviewed contains a number of references to the development of the purchasing function. With a continuously decreasing in-house production depth and a share of goods and services to be procured rising up to 60% depending on the industry, the purchasing function not only has become a strategic asset (Espich, 2004), but also the requirements for highly specialized and well-educated purchasing professionals increased significantly (Vlcek, 2003). Globalization and low-cost country sourcing pose new challenges for the purchasing organization as well as the individual purchasing professional (Trautman, 2008). One necessary action to take advantage of this trend from a purchasing point of view is to develop and customize the occupational image of the purchasing professional (Scholz & Wolff, 2008).

Vlcek (2003) in his contribution to the German “Purchasing Compendium” introduces the future buyer profile and underlines his necessary characteristics (integrity, positive thinking, analytic, economic thinking, enthusiasm, negotiation, ability to compromise, decision making, working in teams, personnel management and creativity) as well as his education and training needs (communication, economy, business administration, tax and customs, finance, IT and e-commerce, contracts and law, logistics, quality management, risk management, languages and specific purchasing methods and tools). The author’s above statements, which are not based on original research, are a good example of how sketchy purchasing professionals’ competency needs are defined even in reference works.

However, it is widely reported that the emergence of the purchasing function and the changes of purchasing activities and tasks demand for updated sets of

competencies. Various authors in the academic field of purchasing competency development agree that the change of paradigm affects the competency requirements on its professionals (Giunipero et al., 2005; Giunipero et al., 2006; Giunipero & Percy, 2000; Mulder et al., 2005; Trautman, 2008). Resulting from the purchasing function gaining in strategic relevance, the role of the purchasing professional has become more and more important and with it, so have the qualification demands (Mulder et al., 2005). Considering this and assuming that purchasing *is* a function that contributes to company success just as much as finance, sales or marketing it might appear that there are precise requirements for competency needs of purchasing professionals, depending on job type and industry sector. Surprisingly and even though remarkable differences in purchasing tasks were identified across different sectors (Mulder et al., 2005), these findings are frequently ignored in individual job requirements, job descriptions, in-house training programs or employment advertisements.

One main theme as synthesized from the sources included in this literature review is the identification of necessary competencies for purchasing professionals. By using different methods and for various purposes, researchers as well as practitioners tried to identify hierarchies of the most important purchasing competencies. Frequently, study outcomes indicate that the development of specific competencies can contribute to the purchasing function's ongoing change process and the competitive position of a company (Carr & Smeltzer, 2000; Giunipero et al., 2005; Giunipero & Percy, 2000). The interest in purchasing competencies arose soon after Peter Kraljic initiated the debate on the general relevance of the purchasing function in company environments in the early 1980s (Kraljic, 1983, 1984). By introducing the

Portfolio Purchasing Model as a standard tool to maximize supply security and cost reduction and by claiming that “*purchasing must become supply management*”, Kraljic (1983, p. 1) moved the purchasing function into a more strategic direction. However, the requirements on purchasing competencies still remained undefined. The next sections will reveal in more detail how the above move of purchasing to a more strategic function effected the research on purchasing competencies from various viewpoints.

j. Competency studies focusing on purchasing performance / effectiveness

As the academic interest in business performance significantly rose from the beginning of the nineteen-eighties, researchers from various academic disciplines started to investigate the impacts of (purchasing) professionals’ *characteristics* on business performance and effectiveness. Like in other studies focusing on purchasing competencies, these identified characteristics are often given in form of lists.

By referencing two unpublished research studies focusing on the fields of purchasing performance measurement and image, Cavinato (1987, p. 42) identified seven competencies top managers “*want to see more of in their companies’ purchasing departments*”. These are: 1. knowledge of materials; 2. production systems and technology; 3. material management, inventory systems and JIT; 4. quality systems and options; 5. contract manufacturing relationships; 6. computer, management information systems and automated purchasing systems; 7. costing and finance lease. Cavinato (1987) also identified an early, central consensus reached by the interviewees from logistics and supply chain top management: Communication skills are considered to be

of essential value, but interestingly back then not for the purpose of successful supplier negotiations, but to internally promote the purchasing department's contribution to the company. Top management rated *internal* communication, negotiation skills and methods of communicating the purchasing function's contribution to the firm among the top priority skills of purchasing professionals (Cavinato, 1987). The peer reviewed article lacks information about the methodology and methods applied in the quoted studies, but nevertheless it provides valuable insights into the study results. The studies referenced by Cavinato do not observe unique aspects of a certain industry and apparently, neither market specifics nor future requirements on employee skills are covered.

Dion and Banting (1987) in their study argue that so called machiavellian, aggressive and opportunistic characters are less successful buyers than characters which favour open, honest and cooperative vendor relationships. The authors raised the question what type of characters are best equipped to become an *effective* buyer. A questionnaire where purchasing professionals were asked about the importance of negotiations as well as the most important performance-affecting buyer characteristics revealed some interesting results. The negotiation process is widely considered more cooperative rather than adversarial and most successful buyers favour long range relationships with suppliers over short term price reductions. Rather than the skill to obtain price concessions in negotiations, negotiation skills to build trust and mutual benefit as well as motivation are considered to be of essential importance. Besides, buyer motivation and certainty of the expectations of the organizations were reported as important characteristics.

Anderson and Katz (1998) in their work highlighted the role of strategic purchasing for the company's growth in value. According to the authors, the purchasing function can positively affect revenue realization as well as competitive costs through cross functional team integration and selective competency development. Identified competency requirements of purchasing professionals are divided into four categories: 1. business development and management (broad business perspective, creative contract writing, and project management), 2. technical (product and service knowledge, cost analysis, problem-solving, and integrated supply chain management), 3. marketing (relationship-building, close linkages between the marketing and sales functions, and quick response capability), 4. sourcing specialist (facilitation, team building, sourcing strategy development, supply evaluation process management, negotiating and contracting, and business case analysis).

Norquist (1998) in the same year reports on a case where two merging companies in the north American oil industry compared the performance of their purchasing personnel. In company A, only professional (purchasing) staff was in charge of purchasing activities, whereas in company B, all purchasing was done by marketing managers. It was found that company A easily outperformed company B in terms of purchasing performance. The author concluded that managers lack the necessary competencies for good purchasing performance and identified five essential purchasing competencies: 1. the ability to comfortably talk about price; 2. knowledge of the available suppliers, the current capacity situation, and the impact of the economy; 3. the patience needed to negotiate successfully; 4. knowing and working the details in order to get value for the money spent; 5. understanding what needs to be kept confidential.

Carr and Smeltzer (2000), through a mail survey, in-depth interviews and exploratory factor analysis aimed to determine whether certain purchasing skills are positively related to strategic purchasing, the organization's financial performance and supplier responsiveness. The authors found out that so called skill techniques (analytical skills, communication skills, presentation skills and other interpersonal skills) support strategic purchasing performance of organizations. Consequently, they suggest companies seeking to strengthen strategic purchasing should develop their purchasing workforce accordingly. It was also discovered that behaviour skills and technical skills do not have significant relationship with strategic purchasing. The authors further explored that technical skills of purchasing professionals support the organization's performance and claim that this finding shows the changing role of purchasing. They finally conclude that technical skills are so important for purchasing professionals because of their raising involvement in diverse activities where technical knowledge must be demonstrated and communicated. Additionally, the authors claim that skill techniques do support supplier responsiveness on purchasing requirements.

From the perspective of new product development, Das and Narasimhan (2000, p. 17) report that purchasing competence has *"a positive impact on manufacturing cost, quality and delivery, as well as new product introduction and customization performance"*. The study focusses the purchasing function as a whole in US manufacturing companies, not individual competencies of purchasing professionals. Purchasing competence is defined here as the *"capability to structure, develop and manage the supply base in alignment with*

the firm's manufacturing and business priorities" (Das & Narasimhan, 2000, p. 18).

With questionnaires and interviews applied to a study population of 131 purchasing executives, Kolchin and Giunipero (1993) published a study performed in behalf of the CAPS Center for Advanced Purchasing Studies. The study aimed at (1.) identifying how the purchasing function is changing when approaching the 21st century, (2.) finding out how this will affect the common body of knowledge in purchasing, (3.) exploring how will these changes affect training and education needs of purchasing professionals and (4.) finding out what resources are available to fill these needs. Besides identifying purchasing trends that most likely will occur in the 21st century, a list of 10 skills was generated that were considered most important for future buyers: 1. interpersonal communication, 2. customer focus, 3. ability to make decisions, 4. negotiation, 5. analytical, 6. managing change, 7. conflict resolution, 8. problem solving, 9. influencing and persuasion and 10. computer literacy. Survey results also showed changes in the ranking when comparing current skill needs to those of the future. By categorizing needed skills in enterprise-, interpersonal- and technical-skills, another major research outcome is that purchasing professionals when looking forward to the year 2000 "*must be technically and interpersonally competent and have a good grasp of the total enterprise*" (Giunipero, 1999, p. 19).

Additionally, the study identified important knowledge areas requiring specific skills as well as the gaps between what is required and what is being provided by means of courses and training in the future. When asking what knowledge areas will be most important for purchasing professionals in the year 2000, the

respondents answered as follows: 1. total quality management, 2. cost of poor quality, 3. supplier relations, 4. analysis of suppliers, 5. lowest total cost, 6. price/cost analysis, 7. source development, 8. quality assurance, 9. supply chain management, 10. competitive market analysis.

Through a case study featuring a survey and in-depth interviews, Giunipero (1999, p. 1) identified “*world class purchasing skills and knowledge*”. The study aimed at providing purchasing managers a database for developing skill matrices (competency models) for purchasing professionals. The Top 15 skills identified were: 1. interpersonal communications, 2. ability to make decisions, 3. ability to work in teams, 4. negotiation skills, 5. customer focus, 6. analytical, 7. influencing and persuasion, 8. understanding business conditions, 9. conflict resolution, 10. managing change, 11. strategic thinking, 12. problem solving, 13. leadership, 14. computer literacy, 15. structuring supplier relationships.

Aiming at identifying the most important skills required for *excellence* in the purchasing profession, Giunipero and Percy (2000) in their search for world class purchasing skills designed a questionnaire and analyzed the ratings of 136 purchasing professionals regarding the importance of 30 purchasing skills. 1. communication, 2. decision making, 3. teamwork, 4. analytical, 5. negotiation, 6. managing change, 7. customer focus, 8. influencing and persuasion, 9. strategic skills and 10. understanding business conditions were identified as the ten most important skills. Through factor analysis, the authors then categorized seven skill areas required by world class purchasers, a term Giunipero in his study defined one year before. These skill areas were 1. strategic, 2. process management, 3. team, 4. decision making, 5. behavioural, 6. negotiation, 7.

quantitative. To emphasize the evolution of the purchasing function, the authors underline the importance of *strategic skills*.

Feisel, et al. (2007) provide a more narrative review of selected sources on purchasing competencies and the link between purchasing competencies and purchasing performance. The authors identify a skills gap of purchasing professionals and underline the importance of skill development in purchasing organizations. Feisel et al. (2007, p. 6) correctly identified the above mentioned study of Giunipero and Percy (2000) as the first one of a “*stream which emphasized the move toward a strategic skill set*”. The above authors later further contributed to the field of studies by investigating *how* strategic purchasing skills can be developed (Feisel, Hartmann, & Giunipero, 2010).

Moorhouse (2006) in his study of 124 senior and director level procurement professionals analyses “*the linkage between the evolution of the procurement role, the ‘real world’ challenges faced by practitioners and the skills and competencies needed by today’s procurement professional*” (Moorhouse, 2006, p. 2). The author identified several challenges of the purchasing function resulting from its new strategic function and which are independent of industry or company size. Surprisingly, almost 70% of the challenges identified were *intra-company challenges*. The three biggest challenges identified were: 1. purchasing professionals face the situation that their new role is not valued and accepted by internal stakeholder; 2. achieving *corporate buy in* to the procurement strategy might be difficult to achieve; 3. purchasing professionals are frequently involved too late in the buying process (Moorhouse, 2006). Study participants agreed that in order to cope with the above challenges, purchasing professionals need to develop several competencies: 1. advanced internal

selling (of purchasing value), 2. strategic influencing, 3. change management and 4. stakeholder management. Interestingly, almost 20 years after Cavinato (1987) first highlighted the need for internal communication skills, convincing internal customers and management seems to stay an important task for purchasing professionals.

Two years later, Tassabehji and Moorhouse (2008, p. 55) interviewed 18 senior purchasing professionals to explore - amongst other questions - "*what portfolio of skills do they believe will enable them to fulfil their role effectively*". Unfortunately, the summarizing peer reviewed article was not available for a detailed review. However, the abstract and quotes in secondary sources underline the impact purchasing skills have on the professionals' ability to fulfil his role, but also points out that a lack of organizational support and acknowledgement prevents purchasing professionals to further progress and develop in this role. The study's main outcome, a "*Procurement Skills Effectiveness Framework*" is claimed to "*enable managers to assess the likely sophistication level of procurement and its impact, given a set of procurement skills and the degree and type of internal support for the role*" (Tassabehji & Moorhouse, 2008, p. 56).

Giunipero et al. (2005), whose study is presented in the next paragraph, add to the discussion that only creative, proactive and motivated purchasing professionals who are willing to take risks can contribute to organizational success.

- k. Purchasing competency studies focusing on strategic- and technical-competencies

To help companies in sustaining their competitive advantage, unique and strategically oriented purchasing activities are required from purchasing professionals. To cope with new responsibilities like strategic supplier management (Carr & Smeltzer, 2000), leveraging cost and innovation potentials as well as managing risks (Giunipero et al., 2005) and building cross-functional teams (Giunipero et al., 2006; Monczka & Trent, 1993), purchasing professionals need to develop strategic competencies. These special competencies support the purchasing function driving towards a more strategic direction (Giunipero et al., 2006) or generally support strategic purchasing (Carr & Smeltzer, 2000). Strategic skills, which were identified as one of the key skills to contribute to the evolution of the purchasing function (Giunipero et al., 2006) include risk management skills as well as strategic planning and managing skills (Tassabehji & Moorhouse, 2008).

Giunipero et al. (2005) in their exploratory study, aimed at developing the idea of *flexibility* into the skill framework for purchasing- and supply chain managers. The authors argue that in order to meet the new challenges of the business environment, *flexibility skills* are necessary to act entrepreneurially. The flexibility skills identified, which are defined as the degree to which purchasers act entrepreneurially are: 1. managing risk, 2. decision making, 3. planning, 4. interpersonal communication, 5. influence and persuasion, 6. internally motivation, 7. creativity. Purchasing professionals with this new and entrepreneurial skill set are claimed to better contribute to organizational success. To meet the challenges of a changing business environment, a *flexible*

and entrepreneurial skill set is needed by purchasing professionals. Acting entrepreneurially in the above areas is necessary to plan projects with multiple stakeholders and to successfully influence and interact with internal customers as well as suppliers (Giunipero et al., 2005).

Given the new strategic role of supply management, Giunipero et al. (2006) in their search for supply manager's future key skill sets and knowledge conducted focus groups to develop grounded theory of the skills evolution within the target population. The study aimed to identify purchasing skills and knowledge necessary in order to maximize the purchasing function's contribution to the organization. Through the qualitative study, the authors explored how purchasing professionals will need a more strategic skill set for "*building strategic relationships, focusing on total cost and strategic cost reduction, yet collaborating and integrating with suppliers*" (Giunipero et al., 2006, p. 822). The need for transactional as well as strategic skills was identified. US purchasing executives described transactional skills as necessary to manage transactional activities (supplier relations, electronic purchasing systems, catalogue buying, accounts payable) and strategic skills to manage strategic activities (managing strategic suppliers, buying system development and implementation, strategic alliances, commodity management). The authors found that the implementation of any new strategic role for purchasing requires the development of a new skill set, including 1. team building (leadership, decision making, influencing and compromising), 2. strategic planning (project scoping, goal setting and execution), 3. communication (presentation, public speaking, listening, writing), 4. technical (web-enabled research, sourcing analysis), 5. financial (cost accounting, making the business case).

In a quantitative study focusing the Uganda public sector, Basheka (2010) and (2012) examines the strategic, tactical, and operational competency requirements of purchasing professionals in a local government context. Based on a catalogue of 50 competencies as identified through a literature review on purchasing competencies, the author collects quantitative data and identifies a comprehensive set of key competencies needed by the target population through factor analysis. From the above results, the author develops a procurement skills requirement framework for the study's target population. The framework consists of the following competency categories: 1. strategic-analytical, 2. tactical-technical, 3. management, 4. analytical-operational. Basheka's above research study is a good example where data identified through a literature review facilitated answering research questions through quantitative data collection – an approach followed in my study as well (see 4.1.1).

Scholz and Wolff (2008), who underline the purchasing professionals' role in company- and supply networks identify the following competencies necessary for *purchasing network managers*: 1. international experience, 2. project management, 3. mediation and moderation, 4. intercultural, 5. detailed market knowledge. Although the above findings do not originate from a research study, they are published in a German edited standard reference and therefore considered a credible source of information.

According to various authors, technical skills of purchasing professionals were considered to determine the success of purchasing departments since the nineteen-eighties (Cavinato, 1987; Kolchin & Giunipero, 1993; McKeefry, 1998). When Tassabehji and Moorhouse (2008) consolidated the literature on

purchasing professionals skill requirements, they found that technical skills are still fundamentally needed to conduct elementary purchasing tasks. Profound technical product knowledge, computer skills as well as category management skills are widely considered the basic skills needed by every purchasing professional (Feisel, Hartmann, Giunipero, & Schober, 2008; Tassabehji & Moorhouse, 2008). As Feisel et al. (2007) report, McKeefry (1998) in his article on the impact of competencies on job opportunities in the purchasing profession claims that in addition to a purchasing education and a deep understanding of the industry, purchasing professionals need financial skills and technical skills to be successful.

Above studies emphasizing technical skills can provide valuable insights for my research as some results could prove to be also true for the situation of purchasing professionals in the ANSP business. The development of communication-, navigation- and surveillance techniques is one important business of many ANSPs. Furthermore, air traffic control systems, hardware and software have a share of at least 50% of the purchasing volume at DFS. With the described business changes ahead and the desire for becoming worldwide leaders in ATC technology and services (DFS, 2015) the need for technical skills in purchasing could even raise in the next few years. It will be interesting to see how my study results reflect the literature view in this respect.

So far, the majority of synthesized studies share some basic results, but as most researchers' findings were attained from different perspectives, only a sketchy statement of purchasing key competencies can be summarized. However, technical competencies, strategic and management competencies as well as communication competencies were mentioned as most important attributes of

purchasing professionals in the majority of synthesized sources (Bayen, 2010; Carr & Smeltzer, 2000; Cavinato, 1987; Dowd & Liedtka, 1994; Giunipero et al., 2005; Giunipero et al., 2006; Killen & Kamauff, 1995; Kolchin & Giunipero, 1993; Murphy, 1995). Even though many scholars in their studies consider communication skills as part of a strategic skill set, they were highlighted remarkably often by researchers even before the “*move towards a strategic skill set*” (Feisel et al., 2007, p. 6) started. Interestingly, certain study results remain the same over a timeframe of two decades while others underlie an obvious change.

As the next two paragraphs show, valuable research findings on purchasing competencies can also be found in studies with a focus on purchasing job types, profiles and roles as well as purchasing tasks and activities.

- I. Purchasing job type, profile and role focus

A lack of common definitions makes it difficult to compare job types and titles in purchasing and leaves specializations within the discipline largely undefined. This bears the risk of knowledge variations as well as differences in training and education of purchasing professionals and prevents bridging the gap between research and practice (Bayen, 2010; Rossetti & Dooley, 2010). Prior research has identified the need to sell the value of purchasing internally (Cavinato, 1987; Mulder et al., 2005). The lack of both, defined job profiles and in-house esteem is a matter of creating an identity within the company for purchasing. Defining future requirements on purchasing professionals' competency profiles can contribute to fill these gaps and draw the bridge to practitioners by helping them to strengthen any such identity within the company.

In their contribution to the NAPM Professional Development Series, Killen and Kamauff (1995) agree that purchasing professionals require new and nontraditional competencies in order to add value within the organization. Interestingly, the authors apply the *The Customer Comes Second* - theory of Rosenbluth and McFerrin Peters (2002) to the field of purchasing personnel while saying that companies have to put their main focus on personnel to be able to satisfy the (internal) customer. Killen and Kamauff (1995) further identify two major job titles, *buyer* and *purchasing manager*, and observe them separately to describe the most desirable skills knowledge areas assigned to them fairly detailed. They describe the necessary competencies of a buyer with: 1. product knowledge, 2. principles of purchasing and management, 3. personal attributes, 4. interpersonal skills. Furthermore, they describe the necessary characteristics of a purchasing manager with: 1. technical knowledge, 2. analytical ability, 3. interpersonal skills, 4. managerial skills. Killen and Kamauff (1995) also describe the purchasing skills of the year 2000 as: 1. interpersonal communication, 2. customer focus, 3. making decisions, 4. negotiation, 5. analyzing, 6. managing change, 7. conflict resolution, 8. problem solving, 9. influencing and persuading, 10. computer literacy.

Murphy (1995) designed a survey to explore details about the changing *roles* of purchasing professionals in the United States. The target group consisted of personnel with various academic backgrounds, ages and roles within the supply management organization of their companies. Even though the researcher does not provide much information about the study design and outline, her results can be summarized to identify certain key competencies the poll respondents consider the most important to fill their specific positions. The vast majority of

quoted statements agree that due to tremendous market changes, the job of purchasing professionals changed dramatically. On one side, mostly because of organizational changes or company decisions, the workload for purchasing professionals became much heavier. On the other side, the decision making power as well as the responsibilities and overall impact on corporate issues increased steadily. Besides, many candidates reported that their involvement with engineering and management became much more intensive. The most important purchasing competencies that can be summarized from the cited answers are technical skills (math and computer literacy), communication skills (negotiation) and strategic skills (management).

In their empirical investigation into (Dutch) buyer profiles, Faes and Matthyssens (1997) focus on the professional purchaser's characteristics by drawing on analogies with former research on salespeople's competency needs. Through linking buyer traits with perceived managerial satisfaction with role performance, the authors develop an *ideal buyer* profile through identifying 21 important buyer characteristics through a literature review before collecting primary interview- and questionnaire-data. By applying cluster analysis, five buyer types were identified: 1. ambitious and self-confident go getters, 2. typical negotiators, 3. all-round care takers, 4. buyers, 5. technical experts. One of the study's main outcomes is that no unique and ideal buyer profile exists.

Koumartzelis (1997) puts in focus the purchasing professionals' role of being a salesperson. Through interviewing a member of top level purchasing management, the author learns that purchasing professionals not only buys things, but also should act as a salesperson within the company. This view is in accordance with Cavinato's (1987) belief that purchasing needs communication

skills in order to internally promote the purchasing department's contribution to the company. Koumantzelis (1997) further claims that purchasing professionals sell the importance and effects of their own role to management and internal customers. Also, purchasing professionals should sell the company's needs and business opportunities to suppliers. The author identified competency needs of purchasing professionals in order to fill the above role: 1. international buying experience, 2. ability to communicate with engineers about quality, 3. knowledge of domestic and world economies.

While Giunipero et al. (2006) divide the purchasing function into strategic and tactical areas and describe profiles for buyers (tactical) and supply managers (strategic), Mulder et al. (2005) in their study identified 105 purchasing tasks based on 10 identified general trends in purchasing and distinguished four job types, two of which are identical to those of Killen and Kamauff (1995): Assistant Buyer, *Buyer*, Senior Buyer and *Purchasing Manager*.

Yu-Ting (2008) in his study concentrates on the *supply chain manager* and confirms that the supply chain manager's competencies are of high demand in the modern business world. The author argues that "*modern supply chain managers are required to possess a set of "multiple intelligences"*" (Yu-Ting, 2008, p. 358). Yu-Ting (2008, p. 352) argues that in order to "*align objectives and share resources across companies to deliver greater value*", supply chain managers main tasks are negotiating with subcontractors and managing remote organizations for a multi-national cooperation. Competencies in sourcing, materials management and global supplier management are needed along with a broad range of managerial competencies and "*such competencies that contain the attitudes, beliefs, knowledge, skills, and behaviors needed for*

success in today's multicultural, global economy" (Yu-Ting, 2008, p. 352). In his study on personnel selection in supply chain management, the author finally develops a multiple criteria decision making method to assist human resources selection activities.

Bayen (2010) in her study identified the role and changing skills needed by (purchasing) *category managers* across industry sectors and drew up a definition of the title. As Bayen (2010) reports, there is an urgent need of purchasing professionals equipped with a broad mix of category manager competencies. Through a survey and interviews with supply chain managers, functional (technical skills) as well as managerial expertise (soft skills) were identified as essential for the above function. Surprisingly, Bayen (2010) points out that this value-orientated approach doesn't necessarily have to be situated in purchasing department, as they "*shouldn't be working within a functional silo*" (Bayen, 2010, p. 1). Category managers are described as process owners which feel comfortable with complexity and ambiguity. As Bayen (2010) reports, earlier EIPM research identified those category manager competencies with the largest gap between the average and top performers (learning needs): 1. project management, 2. market industry knowledge, 3. total cost of ownership, 4. value engineering and value analysis, 5. supplier market analysis, 6. payment conditions, 7. financial analysis of suppliers, 8. supplier relationship management, 9. budget setting, 10. decision taking on make or buy. Finally, Bayen (2010) identifies insufficient training activities for purchasing staff within organizations, a problem which has its grounds in limited focus and resources as well as bottlenecks when it comes to sharing knowledge and best practices.

Rossetti and Dooley (2010) conducted computerized text analyses of job descriptions from advertisements to study what responsibilities and tasks are associated to different supply chain positions and job types. The study goal was to create a job typology and as the only available source of study findings is a peer reviewed article, no details on possibly discovered purchasing competency needs was available. The authors identified eight job types in supply chain management through cluster analysis. Some of the job clusters identified included purchasing related tasks like the *sourcing manager*, who is “*leading a team of procurement professionals*” or “*interacts with finance and accounting*” (Rossetti & Dooley, 2010, p. 49). However, even if some generic competency needs could be deduced from above tasks, the study does not bring much insight when asking for industry specific purchasing activities or competency needs.

m. Purchasing tasks and activities

Some authors in their studies also described purchasing tasks and activities, for example to determine the responsibility of the purchasing function for key decisions (Ellram & Pearson, 1993; Giunipero & Vogt, 1997) or to explore how stress impacts purchasing performance (Michaels, Kumar, & Samu, 1995). As professional competency requirements mainly arise from individual activities, purchasing job analysis and task orientated research was identified as a prominent theme in purchasing competency research. However, purchasing tasks and activities are rarely subject to individual studies. Authors rather tend to include that within a changing purchasing function, new, additional or diversified tasks arise and activities will have to be performed by purchasing professionals (Pechek, 2003) and that therefore new competencies are necessary.

Ellram and Pearson (1993) studied the current and future involvement of purchasing in decision issues. For their survey among 600 purchasing executives, the authors present 18 areas of activity in which purchasing is involved. These are material requirements review, specifications development, make-or-buy analysis, materials standardization, determination of inventory levels, quality requirements determination, negotiation of price and terms, supplier selection, joint problem solving with suppliers, supplier monitoring and analysis, communication of specification changes, productivity/cost improvements, development of sourcing strategy, market analysis, price forecasting, long-range purchasing planning, determination of purchasing policy and value analysis.

Dowlashahi (1992), who explores any role and involvement of purchasing in a concurrent engineering environment identifies potential areas of collaboration and teamwork (activities) between purchasing and product development: developing specifications, part standardization and simplification and value analysis amongst others. However, the study results are gained based on data from the US automotive and manufacturing industry.

Giunipero and Vogt (1997, p. 8) in their research on empowerment in purchasing and purchasing team decisions found that purchasing professionals *“demonstrated a high degree of readiness for incorporating empowerment in their work settings, have adopted many TQM and continuous empowerment techniques in their organizations, and are working as part of teams in their organizations”*.

Muller (1992), by performing a study that identified and analyzed purchasing professionals' tasks and commonalities, concludes that a good share of purchasing professionals' tasks overlap in different industry sectors. Covering a focus group of 4,300 purchasing professionals, the methodology used consisted of paper based questionnaires as well as one-on-one interviews. Muller (1992) identified 69 tasks and analyzed performance across eight mostly US based industry sectors. One of the general outcomes was that the majority of tasks were performed by purchasing professionals regardless of a specific industry sector they were working in. Although Muller's study pays attention to the purchasing professionals' tasks, no implications on the required competencies of purchasing professionals are described.

Muller (2001) in his comprehensive purchasing job analysis identified 22 categories from more than 100 purchasing related activities with the goal to

update examinations for the (purchasing) training programmes *Certified Purchasing Manager* and *Accredited Purchasing Practitioner*. However, again no conclusions on purchasing competency needs were drawn from the study results.

In order to develop a model curriculum for “*Undergraduate Qualification Specializing in Strategic Sourcing and Supply Chain Management*”, Weiss and Fourie (2003, p. 1) draw a comparison of supply chain management activities and strategic sourcing activities. The authors present a collection of strategic sourcing tasks and responsibilities on various job levels as well as a matrix of knowledge, skills and competencies needed in sourcing based on a literature review and internal document analysis. According to the authors, the question what competencies are needed to be a successful sourcing manager can be answered as follows: 1. analytical skills and understanding of analytical tools, 2. business / commercial knowledge and skills, 3. communication skills, 4. team participation and team management skills and e. technical skills.

Hallenbeck, Hautaluoma, and Bates (1999) studied the relationship between boundary-spanning activities and the purchasing manager’s perceptions of positive social outcomes related to work. The authors identified various boundary-spanning activities: 1. gathering information, 2. filtering information, 3. transmitting information, 4. transacting, 5. being proactive, 6. protecting the organization’s interests.

Merminod (2004) in her purchasing job study clearly distinguishes between *required* skills and activities and *used* skills and activities. In her qualitative study, the author identifies activities actually performed by purchasing professionals and skills which are required and actually used. Her taxonomy on

purchasing activities includes twenty activities declared to be realized by purchasers. Her taxonomy of skills is based on 20 competencies which are grouped in: a. global purchasing skills, b. job environment knowledge, c. analytical skills, d. adaptability, e. leadership.

Carter, Carter, Monczka, Slaight, and Swan (2000) in their study on the future of purchasing and supply examined key change drivers and identified - amongst other areas of concern – the trends and changes that might have implications for the purchasing and supply management profession and its professionals. The authors confirm that in order to explore updated sets of competencies, it should be investigated whether new tasks, for example negotiations with international suppliers or strategic tasks to *“contribute to overall business objectives such as growth, profitability, market share, and customer satisfaction will have to be performed in the future”* (Carter et al., 2000, p. 18) .

More recently, Scholz and Wolff (2008) report that buyers spend more than 70% of their time with non-strategic activities, which the authors classify in three categories: a. gathering information, b. working in ERP systems and c. providing data for reports. The authors criticize that for this reason, buyers lack time for value adding activities such as a. market analyses, b. supplier development or c. purchasing process optimization.

My case study aims at identifying what competencies purchasing professionals at DFS have to acquire. It is therefore considered crucial to also examine the tasks and activities that purchasing professionals perform.

Purchasing competency requirements are also sometimes identified by authors reporting on professional education, training and development, which adds an interesting new perspective.

n. Professional education, training and development

Dubois (1993) reports that employees can be trained and developed for current and future jobs through human resource development systems which are based on competency modeling. This can be achieved by assisting them in competency based learning and the acquisition of knowledge in the real world and business practice, for example through measures like simulations, literature, CBTs, coaching or job rotation. Various authors confirm this general statement and claim that effective training is essential to prepare purchasing professionals for current challenges and future opportunities (Carr & Smeltzer, 2000; Giunipero et al., 2006; Larson, 2008; Lau, 2010). Therefore, companies are expected to increase their training budgets and efforts significantly in the future (Giunipero & Handfield, 2004). The determination of training needs and adequate program designs (Stilwell & Anderson, 1965) are necessary to enable purchasing professionals *“to become more strategic in their view and proactive in their contribution to the corporate planning process”* (Killen & Kamauff, 1995, p. 247).

Almost two decades ago, globalization (international product regulations, culturally sensitive negotiation, foreign marketplaces), supply base optimization (effective negotiation) and computerization were described as the main areas of skills various corporate and educational purchasing curricula were focused on (Cruz & Epatko Murph, 1996).

With the emergence of the purchasing function, training curricula and methods evolved as well. The synthesis shows that only few studies managed to integrate questions about education and training of purchasing professionals. However, authors in the field of purchasing skills and competencies agree that the scale of changes in purchasing is so considerable, that an analysis of its evolution in terms of *implications for training and development* is of high interest (Humphreys et al., 1998; Stilwell & Anderson, 1965).

In order to develop strategic purchasing skills, companies started to implement various training and development methods, all of them aiming to enable purchasing professionals contributing to strategic purchasing objectives and overall company success (Giunipero & Handfield, 2004; Larson, 2008). By emphasizing the point that purchasing's growing importance requires a broader education, Cruz and Epatko Murph (1996) identify five long term education fields for purchasing professionals: 1. supply chain management, 2. technology, 3. communication, 4. strategic thinking, 5. education.

As traditional functional boundaries within companies are more and more eliminated in response to new business environments, purchasing professionals are faced with a less clearly defined role and changing responsibilities. As a consequence, purchasing executives are focused on the rising employee skills needed. The improvement of employees through qualification is considered as a very important factor for success by management staff. Interestingly, a trend for the demand for highly specialized and well educated purchasing personnel such as MBAs with a specific set of skills can be observed. With a demand for specialized university degrees such as bachelors in SCM or MBAs, a substantial change in the companies recruitment strategies can be observed (Giunipero &

Handfield, 2004; Humphreys et al., 1998). As Murphree (2006) reports, US based companies seek to hire buyers with graduate degrees in supply chain management, logistics, procurement or finance or even partner with graduate programmes to provide for professional staff development.

Giunipero and Handfield (2004) in their second study on purchasing education and training identified the current status and the expected changes of education and training efforts for purchasing professionals. The work focused on training needs, types of training and the contexts within which the training was planned and delivered. Methods for training implementation ranged from coaching, on-the-job training and instructor based classroom trainings to computer- and internet-based trainings. The study revealed that informal on-the-job training is still the most common type of training applied, but is about to decline in favour of classroom trainings and distance based learning (Giunipero & Handfield, 2004). Through focus groups, the authors analyzed the problems, trends and challenges for the purchasing profession as well as the training requirements. The top 10 problems, trends and challenges were identified as: 1. strategic relationship management with suppliers, 2. strategic cost reduction, 3. increasing process focus, 4. services-based suppliers (need experts), 5. larger relationships with customers and sales teams, 6. greater focus on supplier selection, 7. global purchasing, 8. e-procurement, 9. more industry -specific training and professional certifications, 10. big picture (strategic) focus. The top training requirements were reported as: 1. effective presentation skills (negotiation, problem solving and general communications), 2. business ethics, 3. global diversity, 4. broader business skills, 4. ERP systems implementation and integration, 5. project management, 6. leadership and conflict resolution, 7.

e-procurement (reverse auctioning and supply market research), 8. planning and strategy, 9. planning and strategy, 10. legal contract writing and risk mitigation. Interestingly, Giunipero and Handfield (2004) identified a bachelor's degree in supply chain management or a technical field as the minimum formal education requirement for entry level purchasing professionals. Professional certificates such as the *Certified Purchasing Manager* were also considered valuable.

In-house trainings as well as external education courses are considered practicable ways to improving purchasing professionals' skills (Feisel et al., 2008; Giunipero et al., 2006) and recent studies revealed that participant motivation, course design as well as trainer performance can significantly influence training success (Feisel et al., 2008). Individual needs assessments as well as formal training programmes are developed and implemented by companies in order to support skill development and education of purchasing professionals (Whitehead, as cited by Feisel et al., 2008; Giunipero & Handfield, 2004). The level of purchasing performance is directly related to the volume of training the purchasing professionals receive (Feisel et al., 2008).

Building on the above insights, Feisel et al. (2010) in their study on the importance of the human aspect in the supply function underline the fact of changing purchasing tasks and analyze how additionally required purchasing skills can be acquired. Based on qualitative case study data, the authors explore which instruments in human resources development positively influence skill development.

Larson (2008) in his effort to redesign the Canadian (purchasing) professional accreditation program (Certified Purchasing Manager) conducted a survey and

found out that the target population's most important competencies are of a more generic type (general managerial skills, communication, leadership, relationship building), "*rather than functional or analytical tools and techniques*" (Larson, 2008, p. 1).

Lau (2010) in his search for training needs of industrial supply chain personnel found that following the general trend on purchasing cost reduction, Hong Kong based companies focus on negotiation and communication skills, relationship management and supply analysis. Through a survey among purchasing and supply management practitioners, the author identified a trend for on-the-job training, but criticizes a lack of systematic training approaches in the region.

As mentioned earlier, the development of company specific purchasing competency models supports the development of systematic training approaches. My study seeks to develop such a model.

2.7 Conclusion

This review after balancing the options chose to develop a thematic synthesis of the literature. Whilst different sections have developed their own synthesis this conclusion will develop the overall synthesis and thus provide the ground for the further development of the research.

While competencies in general are a common topic in human resources and business administration studies, purchasing professionals competencies is still an open area of research. Only little research on the identification of purchasing competencies, especially in specific industries has been conducted in Europe. No research on competency requirements for purchasing professionals in the ever-changing ANSP business could be found and a need for further research on the identification of purchasing competencies based on specific tasks and activities is noticeable. Furthermore, the aspect of implicit knowledge on purchasing competency needs is not considered sufficiently in literature on competency modelling or purchasing competency modeling. Although the method of observations is occasionally mentioned in text books on competency modeling, research studies with a focus on model verification through observations and the exploration of implicit knowledge on competency needs are rarely found. However, many sources of information on purchasing competencies were identified in the included sources. As described in Chapter 3, a selection of this more general information on purchasing competencies was later used when setting up a questionnaire for quantitative data collection (supportive data). With a view on the literature review problem formulation (2.2), the following conclusions can be drawn from the synthesis.

What role do competencies play in literature and what are the main areas of interest and application with relevance to my research questions?

The review shows that for the past 60 years, competencies played an important role in literature and research practice of various academic disciplines. The so called competency movement was about to get going when early authors in the field started researching human behavior, success and performance. Quickly, the concept of competencies found its way in human resources management as a powerful tool for performance measurement and boosting organizational success through human capital. Personnel management as well as training and development are the main contexts for applying competencies in organizational environments. Competency based human resources management as one important area of academic and practical interest is based on the idea to use competencies for integrating all human resources applications like hiring, performance measurement, paying systems or succession planning and aligning them to organizational goals. My research study is also situated in the above subject area and focusses on the professional group of purchasing professionals in the ANSP business.

How are competencies used and applied in company environments, what aspects are frequently discussed in this context and what are the implications for my case study?

The review shows that as a reaction to tremendous industry and market shifts, organizations today prefer a competency based approach to human resources management as opposed to the traditional job based approach. Competency identification is common in various industries. Also, original research studies with practical relevance could be identified. Research questions and objectives depend on researcher perspective and focus. Competency identification, the

different approaches to competency modelling, benefits and pitfalls of model development, the role of generic competencies, the different steps of model development from scratch including model validation and the aspect of participation in model development were identified as areas of frequent interest and discussion in the included sources. Reviewing different approaches, designs and methods applied to identify competencies provided valuable insights and will guide my decisions regarding design and methodology of my own study on purchasing competencies. The main approaches to competency modelling – the borrowed / tailored approach and the modelling from scratch approach both influenced my study design. Given the discussion above, my competency model will be largely developed from scratch and consider the professional context, future competency needs and mixed methods for collecting data and thus draw from McLagan (1989) as well as Lucia and Lepsinger's (1999) flexible approaches. However, it will also make use of existing competency data and research results and thus be influenced by the borrowed and tailored approaches to competency modelling as described by Dubois (1993) and Rothwell and Lindholm (1999). Based on existing data as identified through the literature review, new original data will be collected from diverse sources and perspectives and refined and analyzed in a participatory approach to develop the desired competency model. The literature review informed my study design by identifying competencies which were then used to create a questionnaire in the phase of data collection. The value of the literature review for the data collection phase will be described in more detail in Chapter 3.

Also, the identified critique on generic models inspired and confirmed me to develop a competency model that goes beyond the existing generic DFS model.

What is the literature view on current and future competency requirements of purchasing professionals and competency modelling in the profession and what are prominent themes under discussion? Are there sources discussing the aspect of implicit knowledge integration in (purchasing) competency model development?

It is widely reported that the emergence of the purchasing function and the diversification and expansion of purchasing tasks and activities demand for updated sets of competencies. The paradigm shift in purchasing that triggered the discussion about changing competency needs was identified as one recurring theme in purchasing (competency) literature. The review further showed that purchasing competency needs have been identified through original research from diverse perspectives and for various reasons. Different approaches to competency modelling in purchasing have been described with different underlying methodologies and methods depending on the researcher standpoint and objectives. Methods used to collect primary data were quantitative as well as qualitative, but a trend towards qualitative methods is noticeable. However, some recurring themes and results of competency studies in purchasing were highlighted in this literature review. Most studies identified are national studies focusing on US companies or large production industries. Virtually no European studies or studies focusing on purchasing professionals of small or specific industries were found. The majority of identified research studies aim at developing a hierarchy of important purchasing competencies, independent of individual purchasing tasks or activities. Some authors investigated the impact of competencies on organizational success and the correlation of competencies with purchasing performance and effectiveness.

The relevance of strategic skills as well as technical and communication skills was frequently in focus and subject to research and discussions. Purchasing competencies were also identified in studies focusing on job types, profiles and roles in purchasing as well as from the perspective of education, training and development. Moreover, some rare sources focusing on purchasing tasks and activities also identified current and future competency requirements.

The aspect of implicit knowledge is rarely covered in competency studies. However, one study was found which reports that implicit knowledge is applied by purchasing professionals for buying decisions. I argue that the identification of implicit knowledge can support competency modelling. Observations might be a good way to explore participants' competencies and to verify whether additional competencies are used which were not explicitly mentioned when directly asked. However, the review has shown that observations are rarely conducted to identify competencies due to difficulties and criticism. The objections against the observation method are comprehensible and will be discussed in detail further down. From my point of view, the possible advantages of identifying implicit knowledge through observations can justify the efforts needed to minimize or eliminate the risks of poor data results.

Were competency requirements of purchasing professionals in the ANSP business subject to research? Could more general research outcomes be shifted to this specific context?

Most research in the field identifies current and future purchasing professional competencies in general or in few selected US based business areas. No research has been conducted to identify purchasing competency needs in the ANSP business under its changing market conditions. It might be the case that

certain findings of former research works can be shifted to purchasing professionals in the ANSP business. It seems possible that the most frequently identified competencies, like communication skills, technical skills and strategic / management skills are also important for ANSP purchasing professionals.

Changing business environments require changes in purchasing and supply management (Bayen, 2010; Giunipero et al., 2006), but the desired competencies for purchasing professionals vary depending on industries and underlie a consistent change. More complex global markets and increased competition cause big challenges to the discipline and thus may even elevate it to higher levels of importance within organizations. Interviewing subject matter experts of global players from different industries revealed that even though some general key competencies will stand the test of time, individual sets of competencies need to be aligned to the company's strategic goals and designed to fit the specifics of purchasing departments and purchasing professionals' activities (Murphree, 2006). The above findings underline the need for industry specific purchasing competency research and hereby help justifying my research study. Ricciardi (2005) describes competencies as products of correct behaviour which are applied by individuals to complete job related tasks. He argues that competencies are directly tied to work results. Identifying competencies can therefore support results and company success. Most importantly, the above author argues that these critical behaviours and competencies vary from industry to industry. Competency needs should therefore be identified and models should be developed *by each industry and each organization* to obtain optimal behaviour and outcomes (Ricciardi, 2005). I agree with Ricciardi and argue that competencies should be identified on an

organizational level and seek identifying the specific competencies necessary for DFS purchasing professionals through my research study.

Summarized, the literature review has identified a research gap suggesting further research in the field of purchasing competency modelling. Only few studies on purchasing competencies have been conducted in Europe and no studies have focused on the industry of ANSPs. A competency model for ANSP purchasing professionals does not exist. The question on the impact of implicit knowledge on competency modelling was also not sufficiently answered so far.

DFS does not make optimum use of competencies and its current generic competency model. Many of the described negative effects of generic competency models also apply to the existing DFS model. Model development happened through tailoring an existing model, but it is not subject and department specific or future oriented and it underlies no kind of regular revision or iteration. My research study will develop such a model for one professional group within DFS. It will contribute to the literature on competencies with a focus on the purchasing profession, the ANSP industry and its market specifics. I will also consider the aspect of implicit knowledge, which is underrepresented in current literature in the field.

3. Research methodology and methods

This chapter provides a discussion of my philosophical standpoint as a researcher by presenting prominent philosophical schools and by reasoning the association to a certain *research paradigm* (3.1). It also outlines the corresponding *research approach* by justifying the applied methods of logical reasoning (3.2). The latter was considered especially important as the method of reasoning is not consistent throughout the different phases of the research project. As described later, the systematic literature review follows a deductive approach of reasoning as opposed to the empirical research phase, which pursues an inductive logic instead.

Furthermore, Chapter 3 discusses the chosen *research type* and describes the developed *research design*. It shows how the empirical research phase was planned and reasons the decisions that were made when choosing one of the available mixed method designs for collecting and analyzing primary data (3.3).

This research is divided in three subsequent study phases:

- a preliminary phase,
- a model development phase and
- a model verification phase.

Paragraph 3.4 finally introduces these phases as well as the methods applied in each phase to collect data and to answer the research questions.

Paragraph 3.4.1 explains why a preliminary study phase was useful in terms of collecting supportive data to be used in the subsequent model development phase. However, the systematic literature review which was part of the preliminary phase is covered in Chapter 2.

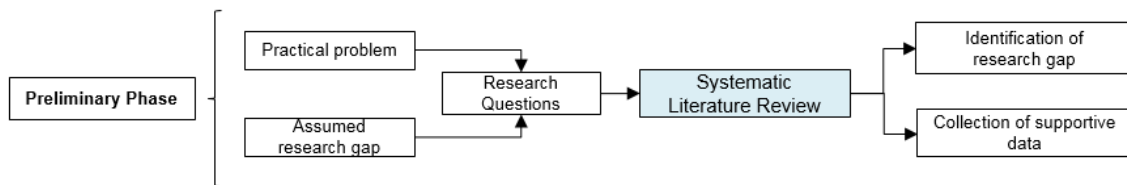


Figure 9 - Preliminary phase

Paragraph 3.4.2 proceeds by introducing the model development phase in which quantitative as well as qualitative data is collected and analyzed.

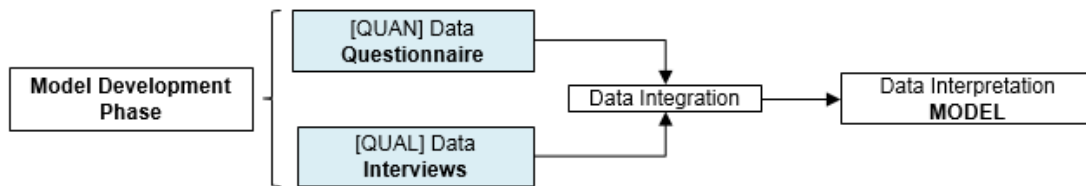


Figure 10 - Model development phase

Finally, paragraph 3.4.3 describes the model verification phase. Here, additional qualitative data is collected to verify the developed model and to possibly reveal implicit participant knowledge on competency needs.

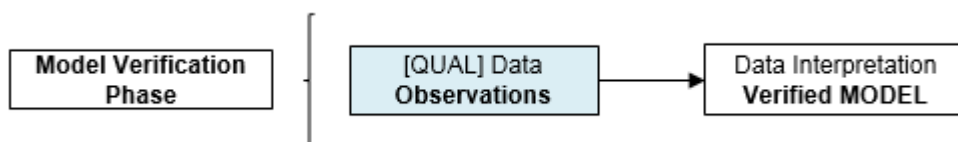


Figure 11 - Model verification phase

3.1 Research philosophy

Scientific research in general is based on assumptions about how the world is perceived and how it can best be understood (Trochim, 2002). When conducting research, the researcher's clear understanding of the own philosophical position is vital to obtain credible study results (Saunders et al., 2009). According to Saunders et al. (2009) and Thomas (2009), in social science the term *research philosophy* usually refers to the questions how to develop and how to use knowledge.

For my DBA studies I chose a research project and topic which is situated in my professional work environment. My project is designed as a piece of practice oriented research and also aims at contributing to the existing body of theoretical knowledge. The latter can only be achieved by rigorously applying proper research methods (Bhattacharjee, 2012). The work in hand also qualifies as a piece of social science as it deals with people in a defined society, their actions and behaviors and their relationship to each other.

I acknowledge the above statement of Saunders et al. (2009) and seek to identify and understand my own perspective on research. Consequently, before starting data collection and analysis to answer the research questions as defined in Chapter 1, I seek to explore and declare my philosophical attitudes regarding world view and the relationship between the development and the use of knowledge. I consider it especially important to explore my philosophical attitude and to demonstrate my understanding of possible alternative schools of thought because the doctoral thesis in hand is my first original research work.

3.1.1 Ontology, epistemology and methodology

I appreciate that the fundamental principles of my research work are grounded in the ontological and epistemological attitudes of myself, the researcher. These rather implicit but explicit formulated stances are manifested in the chosen *approach* and *methods* and they are fundamental to any successful research (Easterby-Smith et al., 2008; Marsh & Furlong, 2002). “*They are like a skin not a sweater: they cannot be put on or taken off whenever the researcher sees fit*” (Marsh & Furlong, 2002, p. 17). This view is also confirmed for the field of study I position myself in - *social* sciences. Burrell and Morgan (1979) claim that the social science researcher’s approach to study is determined by his assumptions of ontology and epistemology.

There are different ways of viewing and understanding the world. In this context, ontology asks questions about the researcher’s worldview, how the world is built for him and what kind of things exist in his reality. Asking for my ontology as a researcher therefore expresses the question “*what is the nature of reality and what am I looking at?*” or, more precise “*is there one real world out there that is independent of [my] knowledge of it?*” (Marsh & Furlong, 2002, p. 18).

In case the researcher’s answer to the latter would be “no”, then he is convinced that *one real world* does not exist – but that the world is a creation which is dependent of cultural and temporal influences - a social construction. This view is especially common in management research where it is not so much a discussion of the nature of the physical world but more the social world.

I can say that the above described denial to imagine the world as a *universally valid world* which is independent of human perception and actions is also true for me. I rather see the world as interpretation of different views and perceptions, especially in managed contexts like company or departmental environments. I seek to examine this flexible world and my research problem from different perspectives and viewpoints to discover *my* truth. We will see further down how my ontological stance affects my desire to acknowledge different interpretations of a certain situation (the world) to gain a complete view on an identified problematic situation.

Epistemology refers to the researcher's assumptions about how the things he sees and the world as he sees it should be studied and is therefore often called the theory of knowledge. Guba (1990) defines the above in a more philosophical way by posing the question what the relationship between the person who knows (the inquirer) and the known (or knowable) is. According to Guba (1990), it is the researcher's epistemological stance that usually lays the foundations of the applied methodology. The researcher's methodology defines how the inquirer should go about finding out knowledge or what methods he should use in research. In case the researcher adheres to objectivity and believes that knowledge can be acquired without interferences, he is *positive* that every researcher observes phenomena with equal results. Otherwise, the researcher denies objectivity, believing that his *observable reality* will always be influenced by factors of social environment and (subjective) individuality. These two major philosophical approaches – subjectivity or objectivity - are delineated by several core assumptions

concerning ontology (reality), epistemology (knowledge) and methods applied (Holden & Lynch, 2004).

Looking back to ontology, the researcher who denies objectivity will probably also dispute the existence of the *one and only real world* in which the meaning of things flows from sheer existence. For me, it makes sense that in the field of social science and especially in management studies, research results will always depend on a variety of subjective factors, which cannot be controlled, but should be considered when *interpreting* the study results. The above described link between a certain ontological position and (corresponding) epistemology will now be examined in more detail for me as a researcher and my research project.

Becoming clear about my ontological view is considered important as in (management) research, certain epistemological positions are linked to corresponding ontological attitudes or, vice versa, certain views on the nature of reality lead to a more or less predefined epistemological frame (Blakie, 1993; Easterby-Smith et al., 2008). Therefore, a top down approach of becoming clear of my ontological view before deciding for a range of methods for data collection and analysis would be logic.

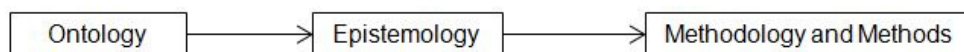


Figure 12 – Top down approach

However, for me as a practitioner, this approach was not applicable for all phases of my research study. Whereas I did follow the above top down approach for the empirical research phase of my project, the systematic literature review I conducted followed a different practice. By reading about

and deciding for a particular literature review method as described in Chapter 2, my research philosophy and my awareness of it just started to develop. At this early stage of my research project, I was not yet aware of my philosophical attitudes, but when learning about different research methods and design frames, the big picture became clearer. Because the literature review started before I learned about the different ontological and epistemological views, the below shown bottom-up approach may visualize what really happened in this phase of my study.

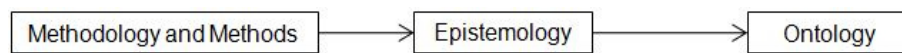


Figure 13 - Bottom up approach

The approach that a certain (implied) epistemology infers from a chosen range of methods was also described by Easterby-Smith et al. (2008). Saunders et al. (2009, p. 106) argue that even though this “*inside-out approach*” is common amongst researchers, thoughts of methods belong to the “*center of the research onion*” whose “*outer layers*” need to be “*peeled away*” first. However, it is obvious that without a clear understanding of these research philosophy basics, there is the danger to apply *methods* incompatible with the researcher’s stance. This might result in a lack of overall coherence of the research project (Blakie, 2000; Easterby-Smith et al., 2008).

3.1.2 Research paradigm

The last paragraph illustrated the opposite positions and approaches a researcher can take regarding ontology and epistemology and also indicated where I position myself. The main reason why discussing this rather theoretical topic is that the different attitudes in research philosophy manifest in various different *research traditions*. These research traditions on the other side tend to imply certain methodological conventions and approaches to research practice. The following section briefly explores the links between the portrayed philosophical traditions and different research methods. It also discusses the possible paradigms for my research enquiry and discusses why I feel most comfortable in one of them.

To become clear about my own paradigmatic position as a researcher and to define a practical research approach for my doctoral research project, I consider it essential to understand the differences in scientific thought and to learn about the evolution of science and its terminology from the time when science was defined as a part of philosophy only, equal to metaphysics, logic, ethics and aesthetics (Bhattacharjee, 2012). I found this especially important as my research topic is situated in the subject area of competencies and knowledge, and as the addition to the body of theoretic and practical knowledge is one overall aim of my research study, a brief excursion to the concept of research paradigms with cross references to my own project seems reasonable. Finally, a justification is provided as to why I situate myself in the *pragmatist* paradigm, which also sets the course for my later choice to follow a mixed method approach for data collection.

3.1.2.1 Rationalism and empiricism

Emerging from the ages when knowledge and knowledge creation was bounded by theological doctrines and faith, human inquiry progressed through the works of Greek philosophers like Pythagoras, Platon and Aristotle who claimed that a more profound understanding of the world could be gained through processes of *logical reasoning* of a rational and truth-seeking mind. In terms of methodology, this so called rationalism can be described as approach “*in which the criterion of the truth is not sensory but intellectual and deductive*” (Bourke, 1962, p. 263). The strong believe in fundamental truths, their cognoscibility and independence from sensory experience or physical proof are the main dogmas of rationalism.

Rationalism and its ideas were later challenged by Francis Bacon and others who favoured real-world observation and empirical work over sole reasoning and building knowledge from logic conclusions. With rather inductive, experimental methods of empiric data collection, empiricism strongly emphasizes the role of direct experience and theory testing through empirical methods. Empiricism influenced later streams of scientific thinking like positivism and post-positivism (Bhattacharjee, 2012).

Albeit attempts have been made to merge the fundamental ideas of rationalism and empiricism into pre-modern science models like natural philosophy, the basic roots of said models influenced various streams of knowledge theories and disputes over the last centuries and remain existent in the most famous paradigmatic streams *positivism* and *Interpretivism* (Bhattacharjee, 2012).

3.1.2.2 Positivism

A positivist researcher believes that all phenomena can be reduced to certain empirical indicators and that truth can be revealed by empirical research only. Objectivity and generalizability are of essential importance for researchers to evaluate findings under the positivist paradigm (Easterby-Smith et al., 2008). Such findings, *the one and only truth*, are considered universally valid, objective and are believed to exist independently of human perception (Sale, Lohfeld, & Brazil, 2002). In this context, knowledge is created from observations of experiments and strongly depends on measurability and researcher-objectivity, while the researcher denies a dichotomy of *what appears to be* and *what is*.

Positivist research approaches are usually deductive and focus on theories, predefined variables and hypothesis-testing within a controlled environment to avoid undesired influences and researcher bias (Guba & Lincoln, 1994). The desire for study control and a linear flow from theory and hypothesis building to data collection, analysis and implications are typical for research studies under the positivist paradigm (Bhattacharjee, 2012). Cause and effect experimental designs and surveys conducted on representative samples of a population are common research methods that lead to quantitative and generalizable data (Williamson, 2006). Research studies under a positivist paradigm today often happen in the field of natural science, where experimental study designs with large study populations lead to quantifiable, precise results which are independent of the individual observer and collected to be tested against theories and hypotheses. However, a positivist approach can also be followed in other fields of science, for example to investigate

phenomena in the fields of politics or healthcare where hypotheses are often tested through the collection and analysis of quantitative data. One consequence from the critique of the pure positivist view was the formation of the post-positivist camp. Researchers adhering to post positivism deviated from believing in strict independency of researcher and research object. While still pursuing researcher objectivity, post positivists acknowledge the influence that social background, researcher theories, personal values and individual knowledge can affect study practice and results (Robson, 2002). By moving one step further from objectivism to subjectivism, post positivists combine empirical observations with logical reasoning (Bhattacharjee, 2012).

Albeit social science traditionally was also grounded in the positivistic paradigm and even today can happen in (post-)positivist tradition, many researchers in the various fields of social science did overcome the empirist-driven models and oriented themselves towards even more *realistic* models that offer ways for a more profound approach to knowledge and truth (Bhattacharjee, 2012).

In social sciences, the *context* in which data is collected and analyzed should be considered as well to ensure its validity and usability. When asking questions in the context of social groups and their behavior, *human experience* and *subjectivity* can add a lot to reach the goal of finding truth. In consequence, a purely positivist approach to research might be considered inadequate in many cases. As I conduct my research project in a professional real-life and social group environment, it is crucial for me to consider these aspects and to not ignore the possible drawbacks of a positivist approach. I acknowledge that unpredictable variables and individual participant views and truths exist in my

research environment. I therefore argue that a positivist research paradigm might not be the ideal approach to answer my research questions. This view also fits to my ontological and epistemological basic beliefs as described earlier.

The above arguments and the fact that my research includes the exploration of implicit knowledge of a social group (research question C) further convinced me that a positivist approach is not suitable to reach my study objectives. The following indicators might additionally support the rejection of a positivist approach and its corresponding methodology for my study. Firstly, the population in which my study takes place is small, so I believe that pure methods of quantification do not fit well to my research setting. Secondly, my defined research questions do not seek to verify or test hypotheses and my study plan indicates that I do not collect data in controlled or controllable environments.

3.1.2.3 Interpretivism

The interpretivistic researcher believes that multiple realities or truths exist that are based on individual (human) constructions and interpretations of reality. Interpretivism is based on the idea that there is a constantly changing reality because of the various, social constructions of it (Guba & Lincoln, 1994). Interpretivism encompasses various different research paradigms focusing on human and social experiences and meanings (Williamson, 2006). Interpretivism, which is in many aspects used as a synonym to constructivism (Schwandt, 2000), consists of certain philosophical and methodological persuasions that share the goal to understand phenomena of lived experience

from the perspective of those who live it. The interpretivistic view builds on the basic belief that social society members are actively and constantly *interpreting* the world they live in and thus build multiple, changing and fragile subjective realities. Reality and truth are therefore individually constructed and different from the one and only positivistic world of nature (Williamson, 2002).

The philosophical position about the nature of reality adopted here is based on the idea that interpretations and individual experiences and beliefs are crucial. By this means, reality itself cannot be artificially built by human imagination, but all knowledge, science, meaning and interpretation is a creation or construction of the human mind and is, albeit possibly *transferable* across different settings, not necessarily universally valid. Through arguing that in the current flexible business environments, certain concepts that arise from qualitative methods are likely to be transferable across settings, I position myself closer to interpretivism and clearly less attached to positivism. Moreover, my philosophical standpoint is determined by the fact that I recognize the relevance of human subjectivity.

So in summary, a positivistic approach to research would not fit to my philosophical attitude. My epistemological position - the assumption about the best way of inquiring into the nature of the world and establishing knowledge and truth tends more to interpretivism. I aim to understand the meaning of happenings in the world and see myself as an (inter-) active part of the research process. However, considering there were only these two radical choices - positivist or interpretivist - I would be in the dilemma of having to opt for either one of two paradigms I both find not 100% suitable for my research

project, especially regarding the sets of data collection methods they tend to bring with (quantitative *or* qualitative).

This dilemma of researchers to be *something in between* became especially apparent when purists argued that qualitative and quantitative approaches would not fit together within one research study because of the differing and concurrent underlying research paradigms. The attitude to demand exclusive superiority of one orientation manifested the so called *incompatibility thesis* in the 1980s (Howe, 2003). The incompatibility thesis disregards the fact that a combination and careful connection of reasoning, arguments and ideas can be reasonable when trying to approach certain research problems. By strictly following and accepting the incompatibility thesis, my research - which includes quantitative as well as qualitative methods - would possibly be rated as inconsistent by purists of the above research paradigms.

Even though I am aware of the different ontological and epistemological positions as well as the corresponding methodologies, I as a practitioner will always balance and reflect my decisions regarding research design and methods applied. Consequently, I cannot position myself under one of the described approaches as I would feel limited and restricted by their strict regime and standards. In my professional business environment and as a purchasing professional, I am seeking pragmatic solutions for daily business problems. This need and behavior was remembered and adopted when designing my research project and when choosing methods for data collection. This means that my practice oriented basic attitude supersedes a rigorous submission to one paradigm or its corresponding methods.

3.1.2.4 Pragmatism

Researchers who felt that both, quantitative and qualitative data can contribute to their specific research problems soon started questioning the incompatibility thesis. From this critique of the purists' viewpoints, new paradigms which share and combine positions from the above described traditions arose.

Practitioners tend to value effectiveness over accuracy and many researchers at the end of the last century acknowledged the importance of context and adopted this view for doing their research. They favoured the *pragmatic approach* to choose and mix the methods available in order to collect the most useful data within one research study. This attitude established a new research paradigm which is called pragmatism and can be seen as "*philosophical partner for mixed methods research*" (Johnson & Onwuegbuzie, 2004, p. 16). Pragmatist researchers do not design their studies according to rigorous concepts of the traditional positivist or interpretivistic paradigms, but make use of the best fitting methods to solve their research problems and gain pragmatic knowledge. One of the major tenets of pragmatism is that "*quantitative and qualitative methods are compatible*" (Molina Azorín & Cameron, 2010, p. 97). Flyvbjerg (2006, p. 242) confirms that under a pragmatic approach to research "*a general relaxation in the old and unproductive separation of qualitative and quantitative methods*" can be noticed.

I appreciate the view that the purists' approaches might be inefficient for answering certain questions in the field of social sciences and management research and might lead to results of limited practical use. Following the view that knowledge creation and its understanding are directly obtained from

experience (Easterby-Smith et al., 2008), I am seeking methods suitable to solve my research problem under the given circumstances (professional environment). Consequently, I am willing to waive the comfort of strict order offered by the traditional approaches in favour of study results of practical use. I do not feel confident within the boundaries of pure positivist or interpretivistic epistemological structures. Albeit sharing some perspectives with the interpretivistic paradigm, my practical approach favours the use of practice-oriented, problem-driven methods instead of rigorously following the methodology attributed to one paradigm.

Accordingly, I position myself in the group of pragmatists, which aim to apply the most appropriate methods for problem-solving (Robson, 2002). My pragmatic attitude is for example manifested by the fact that I chose to conduct a *single case study* at DFS and to apply a *mixed-method design* to reach my research objectives. As I will explain in more detail further down, a case study is appropriate “*in a contemporary situation where the boundaries between the phenomenon and the context are not clearly evident*” (Yin, 2009, p. 18). This situation also supports mixed-method approaches, as pragmatism is frequently reported to be the best paradigm for mixed-method research (Cameron, 2009; Creswell & Plano Clark, 2011; Robson, 2002; Tashakkori & Teddlie, 2003).

The below single-dimension matrix visualizes the range from a pure positivist approach with high emphasis on researcher objectivity to (selected) paradigms involving more subjective views and context sensitivity. Regarding the applied methods, the shown approaches can be assigned to pure qualitative research on the right side of the matrix, pure quantitative research on the left side, and

mixed research in the center of the matrix. Research can involve qualitative methods only, or mixed methods with priority on qualitative ones. It can also rely on quantitative methods only or on mixed methods with focus on quantitative ones. It can also use mixed methods with an equal priority. The red dot indicates where I position myself and the research project in hand.

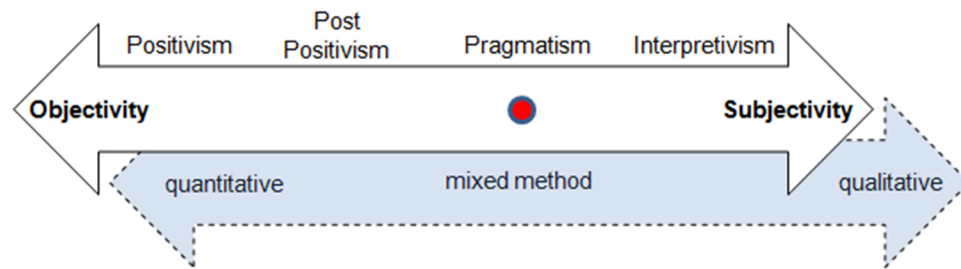


Figure 14 - Subjectivity / objectivity matrix

I will explain further down which methods I used for data collection in my pragmatist approach and how I prioritize them.

3.2 Research approach (method of reasoning)

An important decision regarding the objective and plan to answering the research questions was which general approach to data collection and analysis should be followed. The chosen research approach expresses in which direction the logic of reasoning flows. Generally, the researcher's reasoning can run in two opposite directions, which might end up in different kinds of research results. The two categories that can be divided are *deductive* and *inductive* research approaches (Saunders et al., 2009). Both "*involve interplay of logic and observation and both are routes for the construction of social theories*" (Babbie, 2009, p. 53). This paragraph briefly explains the different approaches and justifies the method(s) of reasoning chosen.

Following a deductive research approach often proceeds through the development of a theory or hypotheses before designing a research strategy to collect data, test and eventually modify it. It is also known as the *top down* or *waterfall* approach. In the deductive approach the reasoning works from the more general to the more specific (Burney, 2008) and owes more to positivism and natural science research (Gray, 2004; Saunders et al., 2009) as it involves using theory at the start of the research project when research questions and objectives are formulated (Yin, 2009).

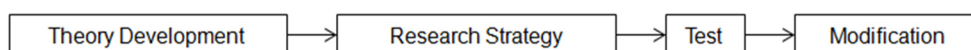


Figure 15 - Deductive approach

An inductive approach on the other side is characterized by collecting and analyzing data with the overall aim to identify patterns, relationships and generalizations and finally to develop a theory from the results. Thomas (2009,

p. 88) states that “*inductive reasoning’s central point is that lots of similar experience leads to general principles*”. The inductive approach is also called the “*hill climbing approach*” and owes more to interpretivism (Gray, 2004; Saunders et al., 2009).

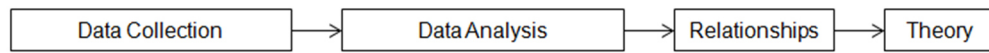


Figure 16 - Inductive approach

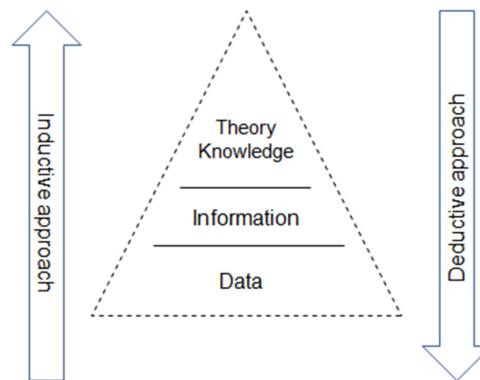


Figure 17 - Inductive / deductive approach pyramid

The importance of informed decisions about the method of reasoning becomes especially apparent when thinking about analytic procedures for analyzing qualitative data which is useful to help answering the research questions. In an inductive approach, analysis will not involve predefined themes or codes, but will help to build them during analysis itself (Saunders et al., 2009). Inductive research is therefore often called *theory-building* research, whereas deductive approaches are mostly to be found in *theory-testing* studies. Bhattacharjee (2012) claims that both types of research are equally important for the advancement of science. In the next two paragraphs, the approaches used for the study in hand are introduced.

3.2.1 Method of reasoning: data collection and analysis

As Thomas (2006, p. 2) states, “*the inductive approach is a systematic procedure for analyzing qualitative data in which the analysis is likely to be guided by specific evaluation objectives*”. It involves collecting data and exploring themes and issues from it to create general propositions (Saunders et al., 2009; Zikmund et al., 2013). Saunders et al. (2009) confirm that the inductive approach is primarily used when no clearly defined theoretical framework exists, but relationships between data will be explored through analysis and theory emerges from collecting and analyzing data.

My clear research focus helps me to work towards reaching the objectives as defined in Chapter 1. However, as I am an integral part of the research process as I interact and actively communicate with the study population, the pursuit of objectivity seems difficult here. As outlined earlier, the applied methodology allows for the collection of qualitative and quantitative data. Both kinds of data are considered important to answer my research questions. A flexible research structure allows for changing certain research emphases during the process. This means that no rigid hypothesis or theory was developed before designing this research strategy and no move from theory to data took place. As I seek to gain understanding of the meanings that my target population attaches to situations or events, I follow an inductive approach. My understanding of an inductive approach is confirmed by Thomas (2006), who explains that detailed data analysis in inductive studies leads to the development of concepts, themes or *models* through researcher interpretation. Thomas (2006, p. 238) also refers to Strauss and Corbin (1998), who state that in inductive research, “*the researcher begins with an area of study and allows the theory to emerge*”

from the data". My goal is to explore findings from "*frequent, dominant, or significant themes inherent in raw data*".

Frequently the question is raised how much pre-understanding of a topic is needed in conducting an inductive research project. I agree with the statement of Saunders et al. (2009) that inductive research cannot be commenced without a competent level of knowledge. The authors claim that inductive research begins with "*clearly defined research questions and objectives, even though this may be altered by the nature of the [collected] data*" (Saunders et al., 2009, p. 503). Thus inductive research often develops from initial approaches, which are refined and elaborated in the study. This statement is reflected in Chapters 1 and 2 of my dissertation, where I decided to formulate research questions and objectives before starting data collection and to comprehensively review the literature base.

Consequently, inductively based analytical procedures to analyze data were applied in my study. These will be explained in more detail when describing the methods for competency model development and verification (3.4). The chosen inductive approach is also reflected in the *exploratory* purpose of my study, which will be described when introducing the research design (3.3).

3.2.2 Method of reasoning: systematic literature review

As outlined, an inductive approach was followed for data collection and analysis. However, when looking at the literature review, it becomes evident that a different approach was chosen to conduct it. In my literature review, I conducted a thematic synthesis which I argue followed a theory driven (deductive) approach. For deductive approaches, Saunders et al. (2009)

underline the need to specify theoretical propositions before data collection and analysis. My research questions were already drafted and the synthesis of evidence was orientated towards the ideas and aims of the project. In the context of a thematic synthesis, I therefore followed the *from theory to data to confirmation* approach. The deductive approach in general is often described as *theory testing*, where testing can also mean refining or improving research questions (Bhattacharjee, 2012). In the context of my systematic literature review, the theory would be my pre-defined research questions. Researchers following an inductive (data driven) approach for their literature review try to find or develop research questions during analyzing the included sources (data) (Dixon-Woods et al., 2005). Consequently, the inductive approach seemed inappropriate for my literature review.

Summarized, the mix of inductive and deductive reasoning turned out to be of advantage for my research. Saunders, et al. (2009) confirm that it is perfectly possible to mix approaches within one research project. Bhattacharjee (2012) adds that a complete researcher needs to be able to handle both types of research: inductive and deductive. In addition, the described mix of approaches inspired me to learn more about mixed method *research designs* as well.

3.3 Research design

After reflecting on my philosophical position and becoming clear about the method(s) of reasoning to follow, I was seeking to design a study which adheres to my pragmatic attitude and research objectives. My goal was to set up a research design best suited to support me in answering my research questions in a scientifically sound and practically and economically reasonable way.

The research design can be generally defined as a framework, a detailed plan which is followed during the entire research project. This framework includes “*procedures for collecting, analyzing, interpreting, and reporting data in research studies*” (Creswell & Plano Clark, 2011, p. 53). According to the wider definition of Philliber, Schwab, and Sloss (1980) this *blueprint* for research deals with at least the aspects what *questions* should be answered, what is the relevant *body of data* and what data should be *collected*, and how to *analyze* this data.

My research project is designed as multi-phase single case study with mixed methods applied for data collection. This paragraph gives a comprehensive overview about mixed method studies in general and reasons the chosen design for my study which, following the suggestion of Selltitz, Wrightsman, and Cook (1981), is of relevance to the purpose of the research project as well as economic to procedure. Again, these two aspects correspond with my pragmatic attitude and accommodate the fact that my research is done in a professional company environment with a focus on solving a problematic situation and creating knowledge with minimal disturbance of participants. The

chosen research design reflects my view of the world and the research philosophy that emerges from it as well as the underlying research approach as depicted above.

By referring to Hartley (2004), the logic and mechanics of my research were designed to ensure it includes all necessary steps to coherently link my research purpose and questions to the chosen methods of data collection as well as its analysis and interpretation. In the following sections, I will define the logic and nature of my research enquiry and also explain the mechanics used to follow this logic. The design and methodology underlying my research builds on my literature review findings and connects primary data collected from different perspectives (target populations) in a continuous and iterative process to build and to verify a competency model. The research project consists of three phases: a. Preliminary phase; b. Competency model development phase; c. Competency model verification phase.

a. Preliminary phase

During the preliminary phase, a practical problem as well as a gap in current literature was addressed and analyzed. The identification of the practical problem and an assumed research gap led to the formulation of three research questions and corresponding research objectives.

The preliminary phase also includes the systematic literature review. The literature was reviewed for two reasons. One goal was to explore how my study topic is situated in the existing body of knowledge and to verify the formulated research gaps. Secondly, the literature review served to collect supportive data to prepare the next study phase (competency model development). The

preliminary phase is covered in Chapter 1 (problem definition and research questions), Chapter 2 (systematic literature review) and also Chapter 4 (data collection and data analysis) as it includes the collection of supportive data.

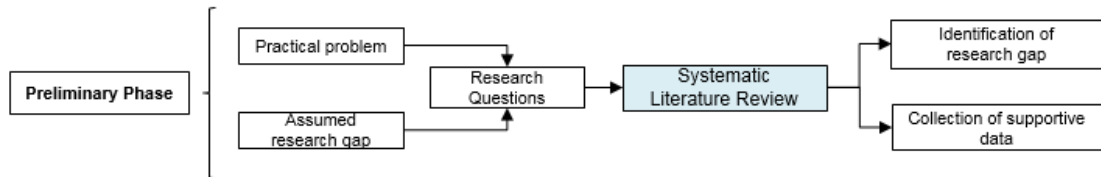


Figure 18 - Preliminary phase

b. Competency model development phase

Phase 2 aims at developing the competency model. This goal is achieved by combining the analyses of quantitative and qualitative data, collected in a convergent parallel design. The concurrently collected data was analyzed and interpreted to develop the competency model for DFS purchasing professionals.

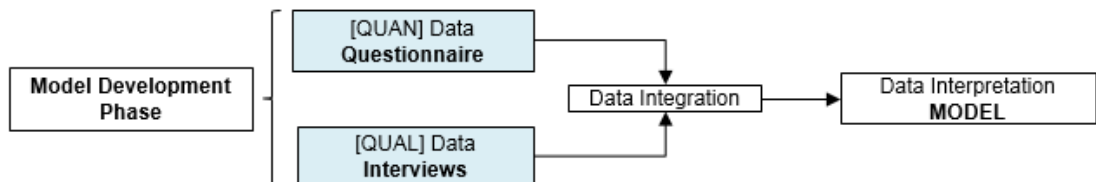


Figure 19 - Model development phase

c. Competency model verification phase

In the third study phase, the developed model is verified. Model verification will be achieved through participant observations and exploration of implicit participant knowledge.

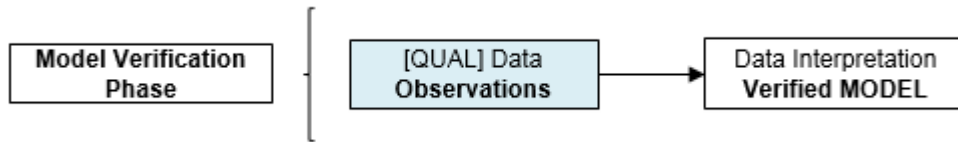


Figure 20 - Model verification phase

Before describing the three study phases in more detail (3.4), the next paragraph defines and reasons the *type of study* conducted.

3.3.1 Study type: Exploratory case study

Looking at my research problem, my intention is to answer research questions which are of exploratory nature. Exploratory research is done to clarify ambiguous situations and to find out *what is happening* in a certain situation or environment. These goals can be achieved by addressing research questions of all types (what, why, how...). Yin (2009, p. 9) confirms that such type of defined research questions is “*a justifiable rationale*” for doing exploratory research and adds that they “*are likely to lead to the use of (...) case studies*”.

Exploration fits well with the pragmatic approach which I argued I feel familiar with. As addressed earlier, the pragmatist seeks to discover the best way of solving a research problem. I like the idea of doing research as *Exploration* as the best ways to move closer to answering my research questions might emerge in the process of progressing. Social exploratory research aims at revealing how people get along in a setting under question. In this way, it can provide significant insight into a given situation. Literature reviews, expert interviews as well as group observations are confirmed as possible ways for doing exploratory studies (Robson, 2002; Saunders et al., 2009; Zikmund et

al., 2013). Saunders et al. (2009) confirm that exploratory research questions aiming to gain a rich understanding of the problem under investigation can be answered best through *case study research*.

My study not only adds to theoretical understanding but contributes to business practice as well. I argue that this motivation to improve a problematic situation again fits well to the pragmatic view I professed earlier. With these two goals in mind, a case study was chosen as appropriate type of study for my research project. The following arguments serve to justify this decision.

Social science research aims at answering questions of interpersonal relationships between individuals in a certain society or social context by interpreting their actions. One way for doing social science research and answering questions aiming to investigate a variety of insights is a case study (Gillham, 2000). Gummesson (1988) adds that one of case research's biggest assets is its holistic and detailed view on the research problem which makes it a preferable approach for social science and management research.

Robert K. Yin is one of the key authors of case study literature and his publications became a much cited and followed resource among researchers aiming to do case research. His definition for case studies can be found in many research papers and text books. Yin (2009, p. 18) defines case studies as *“an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”*.

I appreciate Yin's above definition as it points to four aspects of my own research problem and questions that induced me to think about doing a case study in the first place.

An *empirical inquiry* can be defined as a way of gaining knowledge through direct or indirect observation or experience. It is a systematic study aiming to learn about certain aspects of observable facts or phenomena and to answer defined research questions (Pyrzczak, 2011). In my research study, I systematically collect and record evidence from different sources and through different methods which I later analyze to answer the research questions as defined earlier.

Moreover, the phenomenon I seek to investigate is a *contemporary* one as it takes place in my current professional work environment and is influenced by the very unique present organizational and environmental situation. It is not historical research and the data collected do not rely on historic facts, but current and up to date phenomena and sources.

The *context* in which my study takes place is an organizational professional company environment. The study setting was not artificially built and the research does not take place under controlled (laboratory) conditions. Yin's (2009) above quote also mentions the issue of the boundaries between the phenomenon and the context. I understand from this that studying a case, especially a single case, makes sense when the phenomenon under investigation can only be studied in this particular context. My case is situated in the organization I work in. Studying its specifics is only possible where the phenomenon is – at DFS purchasing department. I argue that it is obvious that my case can only be studied at DFS purchasing department. I can't study DFS

purchasing professionals' competency needs in another place. My research project investigates the competency needs of purchasing professionals in a specific work environment. I believe that it is difficult to understand the target population's competency needs apart from the organizational context they work in and by this means that no division between phenomenon and study setting is possible. The observed phenomenon is therefore connected to the context in which the study takes place and researching one without the other would only give a partial picture of the truth. The research I do is therefore context sensitive and thus the opposite of experimental study design with high degree of control.

Summarized, my research fits in Yin's (2009) definition of case research. Consequently, I acknowledge the conclusions of Merriam (1998), Stake (2005) and Yin (2009) that a case study is a useful methodological frame for examining phenomena under the above described circumstances. Regarding my plan to undertake a case study in my professional work environment, Schell (1992, p. 1) confirms that management and organizational studies "*rely heavily upon the case study as a form of data collection*".

From the many other case study definitions available in my bibliography I found another one which fits very well to my enquiry and adds to Yin's (2009) above definition. Robson (2002) takes into account the (different) sources of evidence when defining case studies: "*[A case study is] a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence*" (Robson, 2002, p. 178).

The data in my research study was collected from different sources: a systematic literature review, a questionnaire, expert interviews and observations. I will explain in detail further down how and why I have mixed data from multiple sources, but one main reason for my multi-source approach was considering different viewpoints and experiences on my study topic and thus to ensure high reliability of the competency model developed and also high acceptance of study results. Lewis (2003) confirms that the motivation for collecting data from multiple sources can make sense in qualitative or mixed research studies. He also notes that through collecting data from multiple sources using multiple methods, an in-depth and intensive analysis of a phenomenon in context can happen through case studies. According to him, conducting a case study may provide data from multiple perspectives “*which are rooted in a specific context*” (Lewis, 2003, p. 52). Saunders et al. (2009) add that multiple sources allow for the collection of data from multiple perspectives and that different data collection techniques can be used for data collection in different groups within a case. The use of different data collection techniques is true for my study and I share the above view and consider a cases study which collects data from multiple sources as appropriate for my project.

According to Schell (1992), misapplication of the case study method leads to incorrect or inconsistent findings. In consequence, the decision for doing a case study should only be made when knowing about the strengths and limitations of the case study approach. As case studies are just one possible way to do social science research, Yin (2009) suggests to consider two more aspects when deciding for or against case research:

- type of research question
- control over events and

Proper research question definition is a crucial step in research planning, as their formulation indicates the appropriate research type and sets the cornerstone for following a rigorous methodological path. As I am inexperienced in doing (case) research, I followed the suggestion of Yin (2009) and set up my case study as a “*linear but iterative process*” (Yin, 2009, p. 1). When preparing my research enquiry in the earliest phase of my doctoral project, initial reading and later a systematic literature review helped shaping my fields of interest and allowed for narrowing down my research ideas and drafted questions to a reasonable number of specific research questions. The research questions were carefully formulated and developed over time during the taught module phase of my doctoral journey at Gloucestershire Business School. However, their focus and wording further evolved in the time when preparing the data collection phase.

Yin (2009) also notes that case study research can contribute to knowledge about phenomena of individuals’ behavior in business contexts and to study small group behavior in real-life events. My choice for doing case research was heavily influenced through the desire to do research within my professional organizational work environment. In my case study, the extent of control over the behavioral events which I intend to exercise was (intentionally) very limited. This means that control was not only limited by nature, but even not desired by the researcher for the following reasons. In company environments, it is easy to control events or people’s behavior by taking advantage of company hierarchies, processes and through orders or even pressure from above.

One way to control the study events in my case would have been for example a management directive to participate in the questionnaire or the explicit order to help developing a competency model that matches management expectations. I made lots of efforts to avoid such effects before starting the case study. Gaining control in such ways would have been contra productive and the study results might have been falsified when people behaved in certain ways they consider positive in the eyes of management or the researcher. Participant trust and voluntariness was considered crucial for data quality and reliability of the case study results and thus was very important for me in my role as a colleague and friend of many study participants.

By doing a case study, I avoided the big disadvantage of having only limited sources of evidence for analysis. Through collecting various forms of data, I was seeking to exploit the biggest strengths of case research: the ability to deal with a full range of evidence - documents, surveys, interviews and observations (Yin, 2009). Doing a multi-method case study seemed more appropriate for reaching my study goals than for example a sole survey. A survey's main purpose is to generalize and verify research findings for other contexts, whereas case research seeks to increase research accuracy by focusing on one specific context (Hossieni, Dehkordi, & Haj, 2012).

A major critique on case research is that study results might be difficult to generalize in other contexts because they are in strong relevance with the individual case study setting. As this critique is even stronger when conducting single case studies, I will deal with it in the next paragraph when justifying my single case.

3.3.1.1 Single case study justification

Yin (2009) suggests to give a strong justification when doing single case research, which will be done in this paragraph. Of the five possible rationales Yin (2009) provides for doing a single case study, I found one very suitable for my research project. The strongest rationale for my case is that it represents a fairly unique issue which, according to Yin (2009) and Schell (1992) might justify its worthiness for being analyzed and documented.

The company environment in which my case study takes place is exceptional. As introduced in Chapter 1, DFS Deutsche Flugsicherung GmbH as German ANSP is the only German company to provide unique safety- and technical services in the air traffic control business in a more and more regulated European and worldwide market. Even in Europe very few companies are comparable to DFS. The reason for this is that DFS is a former and transformed public authority and its status today is the one of a private company in sole government property, which makes the case even more special. Besides, DFS has one unique company object which is assigned by law. Its primary goal is providing safety by controlling the aerospace as well as additional air navigation services without focus on profit maximization. In most countries, there is only one company in this situation.

A multiple case study in this unique company environment might be possible in case more companies like DFS could be identified. This was tried when planning the research project and when deciding about the question to do a single or multiple case study. I therefore considered including all FABEC countries and have five or six cases within a European context (or see it as a

single case with different units of analysis). But this way turned out to be impossible or at least unreasonable for the following reasons. Due to the limited timeframe available for doing my research study, a longitude study with multiple cases would have been much too time consuming. Also, it would have been difficult to convince other European ANSPs to participate in a multi case study as it required high efforts and would have been very time consuming for the individual participants. Additionally, due to the sensible topic of competency modeling, the willingness to participate was very likely to be low. Nevertheless, as soon as results of my single case are available, it might be possible to expand the scope of studies to the European ANSP industry and take the results of this study as basis for a more comprehensive and widespread European case study.

Another strong argument for doing a single case study is the fact that I seek to reveal the grounds for a competency model, which will be of big practical use for the organization under study. Meyer (2001) confirms that single cases are widely used in organizational studies and that they consist of detailed investigations of an organization, aiming to investigate the context and processes involved in a certain phenomenon. Additionally, it is reported that many part time students do single case studies in the organization they work for (Saunders et al., 2009). My case study is a holistic case study as no logical sub units could be identified. The unit of analysis is the professional group of DFS purchasing professionals.

3.3.2 Case validity

Yin (2009) suggests to prove the quality of the case study by testing the case design in terms of construct validity, internal validity, external validity and reliability. According to Yin (2009), these tests should be conducted during the conduction of the case study, not just at the beginning. However, to improve readability and structure of this thesis, this paragraph includes statements to all of the above considerations.

Construct validity should be tested to ensure a sufficiently operational set of measures to minimize subjectivity when collecting data. Yin (2009) describes various tactics to increase construct validity. One of them is to use multiple sources of evidence for answering the research questions. As shown further down, this applies to my study as multiple sources of evidence were used to develop the competency model. Internal validity, however, tries to establish a causal relationship in explanatory or causal studies and is, according to Yin (2009) not applicable for exploratory or descriptive studies. As my case is an exploratory study and does not involve cause and effect investigation, the aspect of internal validity of the case was not further considered in this thesis. External validity deals with the question whether the study's findings are generalizable beyond the case. Critics of the single case approach claim that its results "*offer a poor basis for generalization*" (Yin, 2009, p. 43). However, Yin (2009) argues that this critique only arises because (multi method) cases are contrasted with pure survey research, "*in which a sample is intended to generalize to a larger universe*" (Yin, 2009, p. 43). Yin claims this analogy as incorrect and refers to a *replication logic* of case research.

I understand the above statements of Yin (2009) as follows: Although it might be impossible to generalize the results of a single case to other cases, the case results could be used to argue they might be replicable and thus *transferable* to selected other cases. Such theory, Yin (2009 p.44) claims “*must be tested by replicating the findings in a second or even a third [case]*”. Yin (2009) calls this *analytical generalization* whereas survey research relies on *statistical generalization*.

According to Yin (2009), a case would further be *reliable* when a later researcher, applying the same methodology, would come to the same study outcomes and conclusions. A prerequisite for enabling later researchers to repeat (the same!) case would be proper documentation of the cases, its methodology and the decisions made during conduction of the study. This, I argue, is sufficiently done in this research thesis.

3.3.3 Designing the single case

After becoming clear about undertaking case research as well as deciding for a single case, the next step was to design the study in a rigorous and methodologically sound manner. Unfortunately and in contrast to other research strategies, specific guidelines to case study design are not even provided by the most influential authors in the field. Followers of case research consider this to be one of its strengths while others argument it to be a clear weakness. While the main advantage of this approach might be that the researcher is free to tailor the case design and data collection procedures to the research questions (Meyer, 2001), it seems necessary to respond to said

critique. I will therefore explicitly explain and argument for the methodological choices I made before and during the case study within the next paragraphs.

3.3.3.1 Mixed method approach

From the earlier mentioned paradigm wars and the tendency of the classic methodological movements to either strictly adhere to quantitative or qualitative data, mixed method research has arisen to become the third important research paradigm (Burke Johnson & Onwuegbuzie, 2004). Mixed method designs have been applied by researchers for over 25 years (Pathirage, Amaratunga, & Haigh, 2008) and were developed as one result from the calls for increased methodological diversity (Howard, 1983). They were introduced to expand the scope of single-method studies, to combine strengths of different methods and to offset their weaknesses. The idea behind combining quantitative and qualitative data is that this approach can lead to more complete or trustworthy study results. Mixed method inquiries collect and analyze various types of data, using both quantitative and qualitative methods. This combination of quantitative and qualitative data might enrich the study results in ways that one form of data does not allow (Tashakkori & Teddlie, 1998). Various authors agree that results from one method can enhance insights gained from the complementary method (Creswell & Plano Clark, 2011; Morgan, 2006), while others still claim them to be incompatible. However, as Yin (2009, p. 19) also refers to the “*use of multiple sources of evidence*” in case studies, I argue that that they are or at least can be a form of mixed method research.

In the field of social sciences, mixed method research has become increasingly popular and is considered a legitimate and stand-alone research design (Creswell, 2009; Tashakkori & Teddlie, 1998, 2003). A mixed methods study involves *“the collection and analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research”* (Creswell & Plano Clark, 2011, p. 212; Tashakkori & Teddlie, 2003). More than forty mixed-method designs were identified in recent literature (Tashakkori & Teddlie, 2003). Creswell and Plano Clark (2011) strongly suggest choosing an appropriate mixed method design before starting the inquiry and classify four basic types of mixed method designs: convergent parallel designs, exploratory sequential designs, explanatory sequential designs and embedded designs.

My research aims at exploring competency needs of DFS purchasing professionals. It appears crucial to integrate various stakeholder views when collecting competency data and by this means considering my research problem from different perspectives. The application of different methods to collect quantitative as well as qualitative data and a combination and integration of method results confirms my pragmatic attitude and my desire to choose those methods fitting best to my research environment and conceptual framework. The option to collect different types of data is of advantage and gives me full flexibility when deciding about data collection methods. Quantitative and qualitative methods can complement each other and their plausible and thoughtful combination can lead to more complete and

sophisticated results than single method inquiries (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998).

As a practitioner, the pragmatist approach allows me to use those methods that work to answer my research questions. Pragmatism is reported as the best paradigm for mixed method research (Tashakkori & Teddlie, 2003). From the various methods available, I chose the methods and mixed them in a way that appeared to suit best. Choosing a research design that incorporates quantitative as well as qualitative methods adheres to the idea to integrate both kinds of study results. I will explain further down why certain methods were preferred and what kinds of data were collected by applying them.

I understand that quantitative and qualitative research differs in the underlying assumptions and the methods applied, but as described by Thomas (2009), I found them to be compatible and complementing each other. I am consistent here with my earlier argumentation to include sources with quantitative as well as qualitative study results in my systematic literature review. Burke Johnson and Onwuegbuzie (2004) confirm that the philosophical position of *pragmatism* supports the mixed method researcher:

[It is] productive because it offers an immediate and useful middle position philosophically and methodologically; it offers a practical and outcome-orientated method of inquiry that is based on action and leads, iteratively, to further action and the elimination of doubt; and it offers a method for selecting methodological mixes that can help researchers better answer many of their research questions (p. 17).

From the above mentioned multi-method designs as defined by Creswell and Plano Clark (2011), a *convergent parallel design* was chosen for the phase of

competency model development. In this method, qualitative and quantitative data were collected and analyzed in two parallel strands. The reasons for this choice are discussed further down (3.3.3.2). Verification of the competency model, however, happened at a later stage of the case study. Even though additional qualitative data used for verification was collected in a later study phase, I do not see this as contradiction to the convergent parallel design.

It is recommended by many authors that researchers under the mixed method paradigm should make informed decisions regarding several design issues and choose one of the available designs based on his decision. This means by implication that distinctive features of mixed method studies can be found in the manner in which the different methods are applied as well as in the *emphasis* given to each method (Creswell & Plano Clark, 2011) and in the *stage* in which the different methods are mixed (Tashakkori & Teddlie, 2006). Many key authors in the field of mixed method designs suggest to make four decisions before opting for one specific design (Creswell & Plano Clark, 2011; Creswell, Plano Clark, Gutmann, & Hanson, 2003; Morgan, 1998; Tashakkori & Teddlie, 1998):

- level of interaction
- timing / implementation
- data priority
- integration (where and how to mix)

The *level of interaction* of the quantitative and the qualitative research strands can be independent or interactive. The decision whether to go for a concurrent or sequential approach of mixing methods is mainly based on the level of interaction. In my study, the quantitative and qualitative data for model development is collected and analyzed independently. They are only mixed for

the drawing of conclusions when comparing and interpreting the different sets of collected data. The design and conduct of either strand do not depend on the results of each other. The same applies for the additional qualitative data which is collected later to verify the developed model. The level of data interaction is independent in my case study because the two research strands are distinct. As shown in Chapter 1, the research questions and objectives are kept separate and this logic is followed through keeping data collection and data analysis separate as well. I only mix the two strands when drawing conclusions in the overall interpretation of data when developing the competency model.

Timing / implementation refers to the chronology of the phases in which quantitative and qualitative data is collected during the research study (Creswell & Plano Clark, 2011; Morgan, 2006). The decision of timing is about the question of either concurrently or subsequently collecting the data. The rationale for the implementation of quantitative and qualitative data collection “*relates to the objectives being sought by the researcher in the mixed methods study*” (Creswell & Plano Clark, 2011, p. 171; Morgan, 2006). For my project and in my study environment, collecting original data concurrently turned out to be the best option for developing the competency model. Quantitative data and qualitative data are collected independently and (in theory) contemporaneous from the target populations. The quantitative data set was then contrasted with the qualitative data. However, additional qualitative data to verify the developed competency model was collected after the model development phase, so this data was collected subsequent to the model development phase.

To further specify the nature of data collection, the *priority* that each form of data is given in the research study should be provided (Creswell & Plano Clark, 2011; Morgan, 2006). This requires an informed decision about what method and what kind of data is given more emphasis in the study (Morgan, 1998). Creswell et al. (2003) indicate that an emphasis placed on certain data may depend on different factors, such as the nature of the research questions, the need to understand one form of data before collecting and analyzing to the next or even the audience preference. Even though Creswell et al. (2003) admit that the choice usually rests on the comfort level of the inquirer, they strongly suggest that researchers should make informed decisions on the weight or attention paid to either type of data. For my research study, I decided to give equal priority to both quantitative and qualitative data in the model development phase. To reach the research goals and to fully understand the phenomenon under study, my study design applies both approaches the qualitative and the quantitative equally.

Each kind of data serve to answer an independent research question. As it is my primary goal to answer all research questions, it appears impossible to emphasize one kind of data over the other. As stated earlier, the different strands of data collection do not depend on each other. Quantitative data alone would draw an incomplete picture of the competency needs of DFS purchasing professionals. Emphasizing qualitative data alone might result in a partial or even biased view on the research problem. From my point of view, only a balanced combination of data can lead to proper research results. The same applies to the additional qualitative data which was collected to verify the

developed competency model as it serves to answer an independent research question as well.

Regarding the *stage of data integration*, Tashakkori and Teddlie (1998) suggest to define and justify the stage at which the combination of quantitative and qualitative data takes place. Integration of quantitative and qualitative data happens at two stages of my case study. In the model development phase, data integration happens when both types of data are analyzed. The two data sets will be compared and a possible divergence of participant perceptions about competency needs is explored. When all data is collected in the phase of model development, both data types will be examined independently first, but then compared and put in relation to each other. Independent data is necessary to answer the corresponding research questions, but data combination later serves to interpret overall data for model development. Quantitative data will be compared with qualitative data with the goal to find convergence or divergence of findings. Qualitative data here might expand the results of quantitative data collection. In the model verification phase, qualitative observation data will be collected and contrasted to data results from the model development phase. Creswell et al. (2003) confirm that data integration can occur at multiple stages of the case study process. As described above, this also applies to my study.

3.3.3.2 Convergent parallel design

To further justify my decision for the convergent parallel research design, this paragraph contrasts the chosen approach with another frequently used mixed method design, the *sequential* explanatory design. I find this important

because during the work on my study design, I switched from a sequential to a parallel design after reflecting about the usefulness of data collection in subsequent strands for my study. This section describes the thinking used to develop the research from one that employed a sequential design to one that used a parallel design. It also demonstrates the pragmatic development my research design did undergo as I developed it within the study process. I argue that this is another example substantiating my choice for a pragmatic overall research approach.

The decision to include different strands of data collection and analysis was made for the following reasons. Firstly, there are different target populations I want to collect data from. As the goal of this study is to explore competency needs, it appears advantageous to consider all sources of data which have information on purchasing competency needs in the research environment. Separate consideration of the collected data makes sense as it is considered necessary to contrast the self-image of purchasing professionals with the views and expectations of management and customers. It will be explored whether and how the separate views differ from each other.

The divergence in data collected from the different stands will help identifying those competencies most important for the competency model. Considering the research problem from different perspectives works best when collecting and analyzing data in different strands as well.

With this idea in mind, I had set up a first procedural diagram. The diagram showed the collection and analysis of quantitative data through a questionnaire first, *followed* by the collection and analysis of qualitative data (interviews). In consequence and through further reading about mixed method designs and

typology, I decided to set up and label my conceptual diagram as a *sequential design* as described by Creswell and Plano Clark (2011). Furthermore, as I had decided to collect quantitative data first and by following the typology of Creswell and Plano Clark (2011), I classified my design as sequential explanatory design. To better meet the requirements for a sequential explanatory design, I further developed the drafted sequential design as follows. I planned to collect a broad quantitative data basis from a wide-ranging (administrator employee) perspective. The data from this phase could then be used to prepare the second step in data collection and later be compared to the qualitative data. I felt quite confident with this procedure as it is confirmed by Tashakkori and Teddlie (2006), that *sequential* mixed designs consist of at least two chronological phases of data collection, whereas it is possible to collect quantitative data before qualitative data or vice versa. Tashakkori and Teddlie (2003) further explain that in sequential designs, the results from the second strand often serve to further explain or expand these findings. The researcher might draw conclusions from the first phase of the inquiry and use them as basis for the following phase(s), for example when formulating research questions or choosing methods of data collection. The results after the second phase are then based on this combination of both strands (Tashakkori & Teddlie, 2006).

However, when preparing the quantitative phase (questionnaire) and the qualitative phase (interviews), I soon realized that what I initially planned was not necessary to answer my research questions. When I recognized that the sequence in which quantitative and qualitative data is collected is crucial for classifying the design as either explanatory or exploratory, I started

questioning the chosen sequence and the sequential design for my project. I realized that the sequence I used when drafting my design was chosen randomly or, at best, because I felt more convenient with this set up. I reflected on the research questions and the design I had set up so far and became aware of the fact that I made a mistake. I had tried to build my research around a given design example and not to find the best research design for answering my research questions. I realized that the sequential design was only chosen because I planned to go these steps one after another – which seemed reasonable because I do this research without any assistance and among my main duties in the organization. It was just drawn this way for practical reasons, but not for methodological reasons.

Further reading confirmed to me that if I want to compare different data sets, a *parallel* design would be much more appropriate. As Tashakkori and Teddlie (2006) report,

[...] the strongest inferences [in mixed method studies] were gleaned when a sequential data analysis was performed in which the themes obtained from the QUAL strand were used for comparison of the QUAN data. The inconsistency between the inferences of the two strands was the most striking conclusion from the study (p. 22).

This confirmed for me the need to switch to a concurrent design. Because I did not plan to use the quantitative results for setting up my qualitative data collection (for example influence on interview questions), a sequential design appeared no longer necessary. In consequence, the sequential research design idea was dropped and I switched to a parallel design. Summarized, I

found the convergent parallel design most appropriate for the following reasons:

- Data sets can be collected without need of results from other strand
- Individual analysis of strands
- Equal priority of each strand / set of data
- Merge the two sets of data to assess in what ways the different views converge and diverge
- Mixing strategy: comparison after separate data analysis
- As it is the goal to develop a reliable and widely accepted model, a complete understanding of the situation from diverse datasets is needed
- Typical paradigm foundation for this design is pragmatism – in which I feel safe and comfortable as described above

The convergent parallel design is the most common and wide-spread approach to mixing methods. Since the 1970's, many authors described approaches to concurrently collect and analyze both types of data – quantitative and qualitative – and to merge the two datasets for an holistic interpretation. Morse (1991, p. 122) describes the purpose here as an approach to collect “*different but complementary data on the same topic*”. Creswell and Plano Clark (2011) state that the approach is well suited for combining the strengths of quantitative and qualitative methods by contrasting their results for a deeper understanding of the phenomenon under investigation. Additional reasons might cause a researcher to choose a convergent parallel design, for example in case there is a limited timeframe for data collection or the desire to collect it in “*one visit to the field*” (Creswell & Plano Clark, 2011, p. 77). Also, in case the researcher feels skilled in both types of data collection techniques and collects only limited quantitative and qualitative data, the design is well suited (Creswell & Plano Clark, 2011).

Regarding my research project, the above reasons for doing a convergent parallel design prevail.

The timeframe for my inquiry is limited for two reasons: Firstly, even though the doctoral program is set up for up to seven years (part-time), it is my goal to graduate within four years. Also, from the stakeholders and study-supporter view, there is a need to collect the data within a reasonable timeframe. Secondly, data collection should happen without disturbing the organization too much. An extensive, sequential data collection phase would not cope with this requirement. Generally, I feel sufficiently skilled to collect and analyze both, quantitative and qualitative data because these basic techniques were subject to the taught module phase of my doctoral program. It might not be the strongest logical argument, but I also want to demonstrate these skills in my doctoral thesis and so my willingness to do a mixed method design raised.

According to Creswell and Plano Clark (2011), the earlier described assumptions of pragmatism are well suited when merging two approaches and aiming to gain deeper understanding of a topic. The convergent parallel design process as illustrated by Creswell and Plano Clark (2011) consists of four basic steps: data collection, data analysis, data integration and data interpretation.

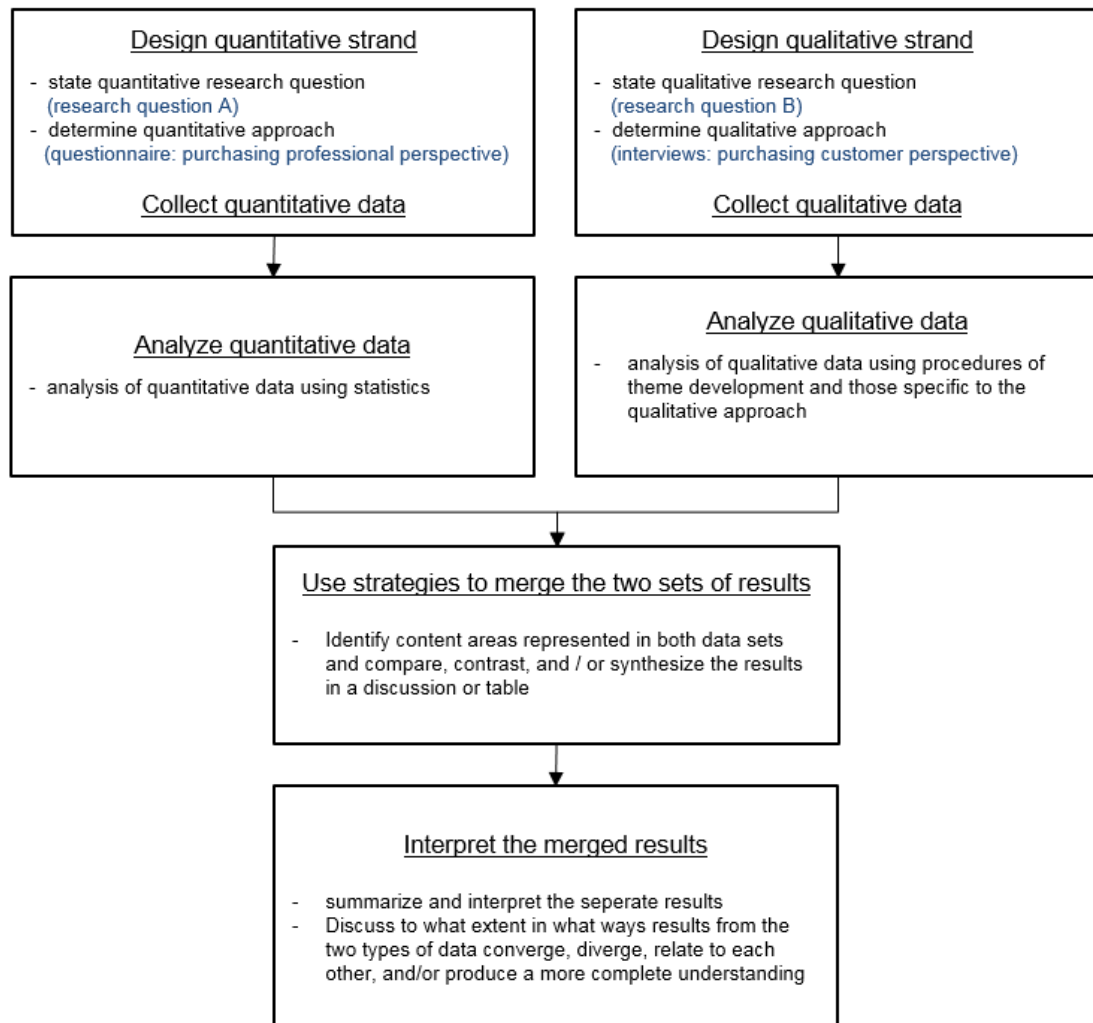


Figure 21 – Convergent parallel design (adopted from Creswell and Plano Clark (2011, p. 79))

The research design introduced in this paragraph was set up during the taught module phase and reworked and finalized during the extensive RD1 phase of the doctoral program. This process was influenced by the discussion with my supervisors and the feedback on my *Methodologies and Methods* paper. Based on the above decisions and following the typology of Creswell and Plano Clark (2011), I chose a convergent parallel research design approach to competency modeling. The choice considers my pragmatic attitude and supports me in solving the task of answering my research questions by mixing methods.

Flyvbjerg (2006) summarizes that

good social science is problem driven (pragmatic!) and not methodology driven that it employs those methods that for a given problematic, best help answer the research questions” and that “more often than not, a combination qualitative and quantitative methods will do the task best (p. 242).

To visualize the mixed method process and following Morse’s (1991) suggestion for a notation system for mixed method studies, the following illustration is used in the figures to describe the chosen design for competency model development and model verification.

Model development: **QUAL + QUAN** → Model

Model verification: **Model + QUAL** → Verified Model

3.4 Research phases and data collection methods

A detailed discussion of the three study phases, data collection methods and data analysis results is presented in Chapter 4. However, the following paragraphs provide an overview on the research phases and data collection methods applied in each study phase.

An additional overview chart of the three study phases and methods applied in each phase is presented in Annex 8.

3.4.1 Phase 1: Preliminary

The preliminary phase served to

- draft the research questions after identifying a problematic situation in business practice
- conduct the systematic literature review including the collection of *supportive data*
- introduce the Expert Forum, a group of insiders to support the study

The initial desire to undertake this study is grounded in the existence of identified organizational problems at DFS purchasing department as well as a gap in the current research base. The latter was identified through the systematic literature review.

The preliminary phase served to become clear about the practical problem in the study environment and to formulate an assumed knowledge gap, both of which were used to formulate the research questions. Phase 1 also included the literature review, which helped to identify current knowledge in the field and to confirm the research gap based on selected literature. In addition, the review served to collect *supportive data* for use in study phase 2.

Introducing the Expert Forum

The preliminary phase was also important to communicate the study plans and to ensure management support of the project. As the research was partly funded by DFS, it appeared crucial to align study objectives with the goals and expectations of the organization as well. Communication of the project benefits with various stakeholders led to some important and design-relevant decisions. From the discussions with purchasing management on how continuous stakeholder involvement during the different steps of the case study could be achieved, the idea of establishing an *Expert Forum* came up. The Expert Forum represents an organizational and personal frame of members that were chosen according to certain criteria to support and promote the case study through predefined activities. The Expert Forum is considered useful for different reasons.

Firstly, it serves as tool to keep the target population and especially purchasing management in the loop and close to the case study. As the study relies on management acceptance, it is considered important to make purchasing top management a part of the research process. Through participating in the model development process, the Forum members gain the sense of cooperation, involvement and integration, which as described earlier is important when setting up a competency model (participatory approach).

Secondly, the Expert Forum helps connecting the different phases of data collection. Through conducting workshops, the Expert Forum serves as an instance for iteratively verifying and processing interim data. Important steps of the case study will be accompanied through Expert Forum workshops. The

results and discussions from these workshops will help to keep an eye on the usability and practicability of data for building the competency model.

The Expert Forum consists of five persons from different hierarchy levels with different backgrounds and ages from different job groups of DFS purchasing department. Thus, the Forum covers different stakeholder views within purchasing department itself, which is of essential importance to support department-wide acceptance of possible study outcomes. Criteria for selecting Expert Forum members included: a. professionalism and experience in purchasing profession as well as knowledge of company structure and personal network; b. job performance, communication and ability to work in a team; c. level of hierarchy and age. A shortlist of possible Expert Forum participants was set up by the researcher and discussed with the chief purchasing officer with the goal to select suitable Expert Forum members. Considering the above criteria, the question of job performance was the one discussed most. The plan to select high performers as Expert Forum members was based on the idea that high performers are assumed to be more competent than low performers and that they might therefore give better input in workshops dealing with job competencies. However, although it was easy to identify high performers, it turned out difficult to document the choices based on existing competency or work output data. As work output at DFS purchasing is measured and documented only in terms of team performance, records of individual performance could not be used to justify employee selection for the Expert Forum. Therefore, it was decided to rely on supervisory judgments as method for identifying (high performing) Expert Forum members. Consequently, all purchasing managers in supervisory functions were asked

to nominate possible Forum members considering all above criteria. The nominated employees were then asked whether they could imagine participating in the Expert Forum. Through this process, diverse and highly motivated Expert Forum members could be identified. Boyatzis (1982) and Spencer and Spencer (1993) confirm peer judgments as valid method for the identification of high performers in competency studies.

There were three Expert Forum workshops conducted as part of the case study. During these workshops, data collection was either prepared or initialized or collected data was discussed and processed to support data analysis. By using Expert Forums, an iterative element was integrated in the data collection and analysis process. All Expert Forum workshops were moderated by the researcher.

The first Expert Forum workshop was conducted after the systematic literature review in study phase 1.

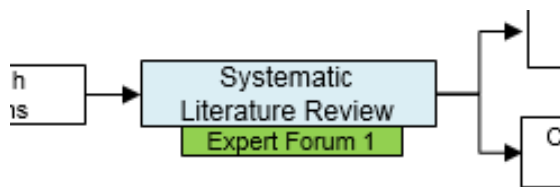


Figure 22 – Expert Forum 1

The second Expert Forum workshop took place after quantitative data collection in the model development phase.

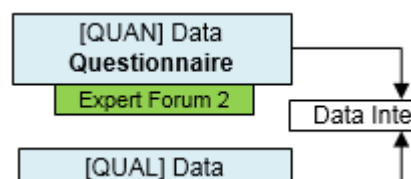


Figure 23 – Expert Forum 2

The third Expert Forum workshop served to develop additional definitions and to discuss the need of behavioral anchors for the identified competencies.

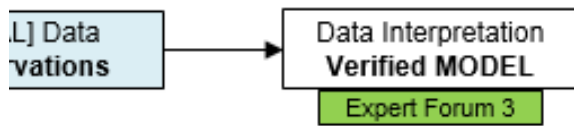


Figure 24 - Expert Forum 3

A detailed discussion of the Expert Forum workshop topics and results is presented in Chapter 4, paragraphs 4.1.2, 4.2.2 and 4.4.5.

Three Methods applied in Expert Forum Workshops

During the Expert Forum workshops, different methods were applied to interact with the Forum members and to reach the session objectives. Brainwriting, a special (written) form of brainstorming, was applied as technique for collecting and processing data. Brainwriting allowed for calm and individual development of ideas for further use in the workshops.



Using Brainwriting ensures that ideas are written down and important thoughts cannot get lost in discussion. Brainwriting is also easy to organize as just one moderator, cards, pens and a pin board is needed, but no additional person to record or document ideas. Brainwriting secures anonymity of idea providers, so pressure or personal attacks during idea generation are minimized. Brainwriting also ensures equal status of all participants. There are no advantages of the more extroverted over the more introverted participants when applying Brainwriting. The status of participants plays no role in

discussion of results because they were generated anonymously. However, some disadvantages of Brainwriting compared to verbal brainstorming or group discussions can be identified. The method is less spontaneous as people have plenty of time to rethink and formulate their ideas. Also, literature on group creativity methods usually consider it a disadvantage when multiple answers of the same idea are possible – which is the case for Brainwriting. As the moderator of the Expert Forum sessions, I did not consider this as a disadvantage as equalities in answers may underline the importance of certain ideas.

A different method was used for data limitation and prioritization during the Expert Forum workshops. By using red stickers or simply numbers, Forum members could prorate certain data with



values to visualize the individual data relevance. The more stickers or values were assigned to an individual piece of data, the more important this data was considered.

As a third method for use during the Expert Forum workshops, moderated group discussions as a more interactive and fast paced method were chosen. Structure, performance and results of the Expert Forum sessions are presented in Chapter 4.

3.4.2 Phase 2: Competency model development

For the process of competency model development, a convergent parallel research design was chosen. Different kinds of data were collected in two parallel strands. Data analysis took place separately after collection of each data set. A questionnaire survey as well as one on one interviews were chosen as methods for data collection in this phase.

3.4.2.1 Questionnaire

A questionnaire survey was conducted to explore the purchasing professionals' self-image on their competency needs. Through the questionnaire, quantitative data about the participant's tasks, activities and needed competencies was collected. The questionnaire served to answer research question A.

What are the competency requirements of DFS purchasing professionals?

Sub-questions

- *What are the actual tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

To answer the above questions, a large body of quantitative data was collected. The target population for the questionnaire was all DFS purchasing professionals. The questionnaire consisted of three parts (A, B, C).

Part A served to collect general and demographic participant data. The data includes information about the participant experience levels and job categories

and forms the basis for possible grouping and identification of different target population perspectives.

Questionnaire Part B deals with purchasing asks, activities and competencies of the study participants. All data had to be provided based on own experience and related to the own and individual position in DFS purchasing department. All information had to be entered into a custom developed diagram and provided the basis for an activity based analysis of competency needs.

Questionnaire part C presents a catalogue of competency attributes related to purchasing professionals. This selection of generic and functional attributes was compiled from the systematic literature review results as well as the first Expert Forum workshop. Part C aims at collecting additional information on competency needs and at exploring the importance of the attributes for the individual participants in their current position in DFS purchasing. The competency information here was provided not based on individual activities, but from a more general and job profile perspective.

The questionnaire analysis revealed the seven main tasks of DFS purchasing professionals in their various functions (high abstraction level) as well as a range of main activities per task. Finally, the most important competencies for each of the activities could be synthesized.

The goal to explore purchasing competency needs from an employee perspective can best be achieved by using a questionnaire. With a questionnaire, it is possible to explore with a large sample what tasks, activities and competency needs for purchasing professionals there are from an employee perspective. Alternatively, closed question interviews might have

been possible to gain the desired results, but this would have been much more costly for the researcher in terms of time and efforts and also more disturbing for the organization under study. A detailed discussion of questionnaire preparation, data collection and analysis is presented in paragraph 4.2.1. A blank questionnaire is attached hereto as Annex 5.

The questionnaire was followed by the second Expert Forum workshop. The workshop served to present, discuss and process the questionnaire results. The primary workshop goal was to verify, prioritize and possibly expand the collected questionnaire data. Also, the workshop served to develop ideas for the interview questions. A more detailed discussion of the Expert Forum workshop conduction and results are presented in Chapter 4.

3.4.2.2 Interviews

The second (parallel) strand in the model development phase involved collecting qualitative data through the conduction of expert interviews. Through the collection of interview data, it was expected to gain a much deeper understanding of purchasing competency needs *compared* to those gained from the questionnaires alone. Semi-structured interviews with purchasing customer representatives and purchasing management served to explore the competency needs of DFS purchasing professionals from these diverse stakeholder perspectives.

As described earlier, the qualitative interview data was compared and put in relation to the quantitative results from the first strand of data collection. Contrasting the qualitative interview data with the quantitative questionnaire results allows for exploring whether customer- and management competency

expectations are reflected in the purchasing professionals' self-image regarding competency needs. In this way, qualitative data served to expand the understanding of competency needs in more depth and from different viewpoints. Collecting interview data thus also adds to the reliability of the competency model which will be built from both data sets.

Looking back at the research problem, qualitative interview data served to answer research question B.

Does the purchasing professionals' self-image on competency requirements reflect customer and management expectations?

Sub-questions

- *What are customer and management expectations on tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

The goal of conducting interviews was to explore the current and future expectations and requirements on purchasing competencies in more detail and from diverse stakeholder perspectives. This could be achieved by questioning customer's and management's views on the purchasing function, tasks and activities as well as specific purchasing competency needs. By revealing possible gaps between the information gained so far from the questionnaires and the data analyzed from the interviews, additional needs for purchasing competency development might become apparent. These could then be added to the database forming the competency model.

Purchasing department as service provider within DFS needs to orient itself towards internal customer's needs and expectations. These requirements are influenced by the customer's actual and upcoming requirements and

challenges in which they need purchasing department's expertise and support. The need for purchasing support arises from daily- and project business, purchase requisitions, need for external know-how, services, temporary personnel, technical challenges, organizational- or market-changes, or political and legal requirements. It will be interesting to see whether the interview results differ from the self-image of purchasing professionals as analyzed from the questionnaire. Besides and in order to ensure broad stakeholder identification and acceptance of the developed model, it appears reasonable to explore the diverse notions regarding model contents and structure held by the target population.

All the above information can best be collected through conducting interviews. Additional questionnaires among purchasing customers and management might also have brought some deeper insights, but it was considered more fruitful by the researcher to reveal new information on competency needs through an analysis of individual statements and interpretation of participant narratives. Also, it was believed that purchasing customers and management would favour giving an interview over filling out a multi-page questionnaire. This view is confirmed by Saunders et al. (2009), who add that when it comes to participate in data collection measures, managers prefer interviews, not questionnaires.

Possible interview partners were discussed with the chief purchasing officer and the selection was based on relevance as purchasing customer, availability and willingness to participate in the study. All selected participants are DFS employees with management and personnel responsibility in their departments. As I have a good network and business relationship to most

purchasing customer representatives, at least two managers of each customer business unit were personally approached and asked whether they could imagine supporting the case study. From a list of 21 potential interview partners, a number of nine were randomly selected. It was then checked whether these nine persons represent a sufficient number of relevant customers. As the seven most important customer departments (purchasing value and number of service requests) were represented by the selected interview partners, the above selection was considered reasonably representative.

Additionally, three of four purchasing managers with personnel responsibility were added to the list of interviewees. Summarized, a total of 12 interviews were conducted.

Interview questions were developed with the goal to collect data helpful for answering the above research question. The main topics for interview questions were discussed and jointly developed mainly from the results of the second Expert Forum workshop, which will be outlined in detail in paragraph 4.2.2. The Expert Forum members agreed that the interviewees should be asked for their views and expectations on the purchasing function, purchasing professionals tasks and activities, views and expectations regarding purchasing competencies, the future situation that might influence purchasing professionals' tasks, activities and competencies as well as their opinion of competency model structure and process of development.

All potential participants were invited via personal emails, which included information on the research questions and objectives and a facilitated study

plan as well as an informed consent form with information on data collection, analysis and usage (Annex 3).

Generally, conducting expert interviews can support case study research in collecting reliable data relevant to reach the study objectives. However, the case researcher needs to decide whether to conduct highly formalized (standardized) interviews with fixed questions or non-standardized (semi-structured) interviews (Saunders et al., 2009). For the case study in hand, it was decided to conduct non-standardized interviews for the following reasons:

- Due to the limited amount of interviews, it was vital to get the most out of every single interview. Too strict formalization without the possibility to vary questions during interviews and to probe on interview statements might have limited the insights gained from them.
- Due to the heterogeneity of the target population (interviewees from different organizational contexts), it was considered important to have the freedom to adjust questioning according to interview progress.
- Due to the sensitive interview topic of employee competencies it might be necessary to omit planned questions or change formulation or ask additional questions to get most useful information from respondents.
- Lesser standardized interviews are commonly believed to be more appropriate to collect qualitative data, for example in case studies (Zikmund et al., 2013). Vice versa, highly standardized questionnaires might be the better choice when additional quantitative data would be needed.
- Semi structured interviews are more flexible and can be adjusted in a way the researcher feels appropriate (Robson, 2002). Easterby-Smith et al. (2008) further note that semi structured, non-standardized interviews are a good choice where the order and logic of questions may need to be varied.
- This approach to conducting interviews perfectly corresponds with my pragmatic attitude as defended earlier (3.1.2.4).

In case studies of exploratory nature, semi structured interviews are expected to be helpful to seek new insights (Robson, 2002, p. 59). They are also confirmed to be useful to further substantiate or complement results that have emerged from a questionnaire (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998), which is also intended for my case study. As it is my goal to more deeply understand competency requirements of DFS purchasing professionals and the reasons for interviewee's statements on competency needs to draw conclusions (exploratory nature), it was decided to conduct semi-structured interviews. This interview form allows for variations in questioning and extensive probing to fully understand the interviewee's statements and to explore their meanings. I believe that non-standardized interviews and an open interview structure allow participants to think more about individual questions and to explore their own opinion while talking, posing counter questions and discussing.

Saunders et al. (2009) argue that conducting non-standardized interviews is linked to a more interpretivist research approach. I earlier stated that -albeit positioning myself as pragmatist researcher- share some perspectives with the interpretivist paradigm. Regarding research design it is further confirmed that semi structured interviews are often part of mixed method designs and may help verifying findings (data) from questionnaires or to expand the data gained from them (Saunders et al., 2009; Zikmund et al., 2013). For all the above reasons, conducting non-standardized interviews and interpretation of results is considered vital to reach my study goals and therefore adopted for my case study.

However, Saunders et al. (2009) also suggest to consider some organizational and formal aspects of conducting interviews. A decision needs to be made whether one on one or group interviews should be conducted. For my case study, one on one interviews as opposed to group interviews were chosen due to heterogeneity of interviewees, the sensitive topic and for organizational reasons. As the chosen purchasing customer representatives and managers usually have very busy schedules and because the interview partners are situated at different DFS locations, one on one interviews were considered a more practicable way. Also, group interviews seemed inappropriate because a sensitive topic (employee competency needs) would be discussed.

Another important aspect to consider when planning interviews is to ensure a high degree of data reliability. One way to contribute to data reliability is becoming aware of and possibly avoiding interviewer and interviewee bias. Interviewer bias could occur when the researcher's own beliefs are brought in the interviews, for example through asking biased questions, through influencing behavior or tone during interview sessions or even through interpreting data in desired and predefined directions. For the study in hand, the danger of bias was acknowledged and actively countered. Interviewer bias was mainly prevented through jointly discussing interview questions in the second Expert Forum workshop. All interviews were conducted by using an interview guideline to ensure all interviews were guided by the same topics and questions and all interviewees given the same background information (Annex 6), which is also considered a measure to minimize interviewer bias. Also, during the interviews, main statements of interviewees were sometimes

summarized or repeated by the interviewer to avoid bias in interpretation of speech.

As Robson (2002) remarks, interviewees might decide to withhold important information to avoid probing or discussions of sensitive information. Also time pressure might reduce the interviewee's willingness to provide comprehensive information. All interviewees were informed early (email invitation) about the general interview topics and structure of questions so that they could prepare themselves. Also, enough time was provided during the interviews for answering or reflecting upon the posed questions. This was expected to support richness and quality of interview data and gave the interviewees more control of the interview sessions and the trust not to be surprised by inconvenient questions. Saunders et al. (2009) confirm that a high level of interviewee trust as well as interviewer credibility supports data reliability.

Generalizability of interview data. In addition to the remarks on case validity I made earlier (3.3.2), the following should be said regarding the generalizability of interview findings. Especially in single case studies with relatively small study populations, (interview) results cannot be used to make statistically generalizations about the whole study population, which is a clear weakness of (single) case studies (Yin 2003). Presuming that the whole study population would be purchasing professionals in general (not ANSP related), I agree to this. However, in case the whole study population would be defined as ANSP purchasing professionals, I argue that the results might possibly be transferable for the purchasing professionals of other ANSPs. As further response to the critique of non-generalizability I argue that my findings are not even *intended* to be universally generalizable. The case study outcomes

reflect reality at the time the study was conducted. Especially when studying dynamic subjects in volatile environments which underlie change, like competencies, generalizability of results could generally be questioned, not only for (single) case studies. Results of my case study are expected to be time bound and later researchers should be aware of the fact that data replication might be unfeasible and not realistic and that reanalysis of data and new data collection is necessary for later cases.

In order to get high quality interview results, Saunders et al. (2009) have some additional suggestions for interview preparation:

- *Have knowledge about topic*

Through my status as an insider to the research setting as well as through the literature review conducted, I am a well-informed researcher. This contributes to demonstrate credibility and might encourage interviewees to offer more details, which can potentially raise data quality.

- *Find appropriate location (private, confidential and convenient)*

The interviews were conducted in the interviewee's single person offices or in a small meeting room with closed doors and calm environments to avoid disturbances or time pressure.

- *Make good opening comments*

As apparent from the interview guideline, a certain timeframe was blocked for greeting, words of thanks and small talk and to clarify first questions, to underline confidentiality and voluntariness, to collect the informed consent form with signature and to ask for permission to audio record the interview. Saunders et al. (2009) mention that all the above can add to gain interviewees credibility and confidence.

- *Ensure neutral approach to questioning and behavior*

During the interviews, it was tried to clearly phrase the questions in a neutral, but not abstract or unnatural tone. Non-verbal behavior was kept to a minimum to not influence interviewees. Interviewer expressions of

disbelieve, consent or boredom, albeit present from time to time, were suppressed.

Interviews were conducted one-on-one in a face to face situation. The interview questions were guided by a catalogue of topics and a structure for questioning and interaction (interview guideline). As described above, the intended questions were sometimes changed or tailored during the interview as new and interesting aspects were uncovered in the participant's responses and "*in order to follow interesting lines of enquiry and to facilitate an unbroken discussion*" (Easterby-Smith et al., 2008, p. 143). Nevertheless, the "*exact area of interest*" (Easterby-Smith et al., 2008, p. 144) was always kept in sight. Non-verbal interview contents were not considered important for the interview and therefore not documented. Basically, the interview consisted of around 20 questions with some of them containing clarifications or sub questions to facilitate answering and analysis. A total interview time of 471,55 minutes was recorded by using a digital voice recorder. The recordings were transferred to a computer and manually transcribed. Transcription was done partly by myself (30%) and partly by a professional transcription service (70%). The original plan to transcribe all interviews by myself had to be dropped due to time constraints. The process of transcription turned out to be much more time consuming than expected. As I am inexperienced in transcribing interview audio data, it took approximately five minutes work for the transcription of one recorded audio minute. Approximately 80 pages of interview transcriptions were generated for analysis.

The process of interviewing and data analysis is covered in Chapter 4.

3.4.3 Phase 3: Competency model verification

As announced in Chapter 2 when the reported need to *validate* developed competency models was addressed, this paragraph describes my position towards this discussion. As the issue of validity is a sensitive topic, I consider it necessary to discuss it in more detail.

Claiming my developed competency model to be *valid* or *validated* from my point of view would require two things. Firstly, prove would be needed that the model development process includes all variables that were useful and omitting those that were not for identifying competencies. This would require a demonstration that all the factors known to be important were considered and the methods of measuring them were appropriate and thus an accurate way of measuring competencies. Secondly, one might argue that a valid competency model should be *generalizable* to some extent.

I consider proving model validity difficult for various reasons. The model development process was set up as part of an explorative research design of a pragmatic researcher who chose the best fitting methods to answer defined research questions. As the justification of methods used in this study strongly depends on my argumentation and balancing of alternatives, claiming universal validity of either methods or results would be questionable. Arguing universal validity would also not correspond to my worldview as defined earlier. My denial of a universally valid world would clash with the claim that my developed study results are universally valid for every case imaginable.

However, I do appreciate the view of authors such as Dalton (1997) or Lucia and Lepsinger (1999) and agree that a model once developed should be as

good, complete and reliable as possible. For this reason, it was decided to add a third phase to the research design: Phase 3: *Model verification*.

The idea behind it is to raise the value of the study results by making the developed model a more complete, a more reliable and thus a more trustworthy one. Higher reliability in terms of the modeling process would mean that if repeated, the research would give the same results.

Summarized, the goal of adding a third research phase was *not to validate* the model or modeling process, but to work towards making the model a more credible one, to make the modeling process more logically sound and to give the reader less reason to believe it is not right or trustworthy. As already mentioned when outlining the research objectives in paragraph 1.5, these goals will be achieved by conducting participant observations and by considering the aspect of implicit knowledge on competency needs.

As described in the systematic literature review, it is suggested by many authors to make sure a developed model is reliable and reflects actual competency needs. Following the suggestion of Dubois (1993), model reliability as described above was achieved through collecting additional data. After the competency model was developed from the combination of quantitative and qualitative data, it was verified through collecting and analyzing observation data.

3.4.3.1 Observations

To verify the developed competency model as outlined above, it was decided to collect and qualitatively analyze observation data. The goal is to observe what activities are performed by purchasing professionals and what competencies are applied by them, compared to what they have claimed in the questionnaire. This approach is reflected in research question C.

Does the purchasing professionals' self-image on competency requirements reflect business practice?

Sub-questions

- *Is there implicit knowledge of competency needs?*
- *Does the model need to be amended?*

Through observations, it is possible to explore the purchasing professionals' implicit knowledge on their purchasing activities and corresponding competency needs. The idea of verifying the model in this way builds on the phenomenon that what people say they do or believe is often contradicted by their actual behavior. Through observing whether the purchasing professionals' self-image is reflected in purchasing professionals' behavior, activities and application of competencies, this final phase of the case study verifies the developed competency model from a knowledge management perspective.

According to Mack, Woodsong, McQueen, Guest, and Namey (2005, p. 13), "*observation can be a powerful check against what people report about themselves*" and by this means to approach the above mentioned "*human inconsistency*". Observations can serve to examine participants' subjective reporting about their actions. Observations are often conducted "*to address*

questions suggested by data collected using other methods" (Mack et al., 2005, p. 19).

Interestingly, Guest, Namey, and Mitchell (2012, p. 77) refer to a common phrase of those who feel their verbal expression does not cover all aspects of a situation or event when reporting about it: "*you had to be there*". I would interpret this statement as "*I can't express what happened, you have to see it with your own eyes.*" In the context of this study, being at the scene might reveal insights to DFS purchasing professionals' activities and needed (applied) competencies which might have remained hidden in subjective reports (questionnaires) of the study population. Applied in research studies, observations might reveal unspoken habits which are taken for granted or routine actions happening below the level of conscious thought, or information which is thought to be not important or remains unrecognized for other reasons (Guest et al., 2012). All of the above might be missing in the data collected through the questionnaires from phase 2 of the case study – and could now be revealed through participant observations. Here is the connection to implicit participant knowledge and the verification of the developed competency model.

This paragraph introduces the method of participant observations as part of the study design. It discusses the strengths and weaknesses of the method in the context of the case study in hand and illustrates the stance of the researcher in his role as observer and part of the study environment.

Typically applied as part of a more qualitative research paradigm, (participant) observations can serve to gain close familiarity with a certain population under study. Frank Hamilton Cushing, an American ethnologist fascinated by the

Indian culture of North America stayed with the Zuni Indians for more than five years and thus became a pioneer of participant observations. Later, social anthropologists like Bronislaw Malinowski or Franz Boas influenced the evolvement of field research and the observation method in the 19th century. Observation as method for data collection was further developed by the so called Chicago School of Urban Sociologists in the early 20th century.

Observations are still widely applied in social research today. The method allows for an intensive immersion into the study environment, learning the views held by a certain population and “*breathing the everyday reality*” of a setting (Di Domenico & Phillips, 2012, p. 1). In this method, the observing person serves as the primary instrument for perceiving information and collecting data. Observations sometimes help to explore multiple perspectives and often involve interaction with the individuals under investigation. The goal of the observer is usually to describe human behavior in the actual (case) study environment (Creswell et al., 2003).

Observations are considered a useful method in my research context and situation as they are usually part of qualitative or mixed method approaches, often explorative in nature and frequently applied when there is a lack of empirical evidence in the field under investigation. Observations can be conducted overt or, in rare cases, covert (Di Domenico & Phillips, 2012) and they do not necessarily involve researcher passivity, but can also include informal interviews or discussions as well as analyzing documents or life histories. However, observation analysis is not limited to qualitative data, but can also include quantitative dimensions.

There is no standard definition for observation in the context of research studies and authors in the field use the term differently, for example as “*observation and interviewing of anthropologists*” or to describe the general approach of “*fieldwork in ethnographic research*” (Agar, 1985; Spradley, 1980 as cited by DeWalt, DeWalt & Wayland, 1998, p.259). However, the different types of observations which will be mentioned further down allow for a large variety of definitions. This case study follows the definition of DeWalt et al. (1998), who consider participant observation as

participating and observing the people [...] with whom we are working and acknowledge that the method [...] includes the explicit use of behavioral analysis and recording of the information gained from participating and observing (p. 259).

Locations. Observations usually take place at the setting of interest for the researcher, an environment with direct relevance to the research questions and objectives (Mack et al., 2005). For the study in hand, observations were conducted at various locations and during different situations in the setting of DFS purchasing professionals’ day to day business. The locations were not limited to personal office spaces, but included various sorts of meeting situations, discussions with internal customers, suppliers or peers, and office work. Observing purchasing professionals in different locations and situations seemed reasonable because in an agile and flexible office environment, certain employee activities are not bound to defined locations, but might be chosen randomly and depending on individual requirements. The question to what degree the researcher might act as an insider or outsider during observations will be discussed further down.

Strengths. Among the reported strengths of observations is one aspect that fits quite well to the above idea to verify and possibly expand the competency model which was developed from questionnaire and interview data. DeWalt et al. (1998) argue that observations offer the researcher a possibility to discover discrepancies between what participants say and what actually happens. Moreover, Mack et al. (2005, p. 14) claim that they lead to data which can “*serve as a check against participant’s subjective reporting of what they believe an do*”.

Here it becomes apparent how valuable observations can be for verifying the developed competency model. As the model was built by using data from purchasing professionals’ own perception of their activities and corresponding competency needs and by comparing this self-image with the views of other stakeholders (public-image), observations will now reveal whether what purchasing professionals claimed to be the most important competencies are really of such relevance or whether different activities are performed and other competencies are applied and thus also or even more important in business practice. Mack et al. (2005) confirm that observations are useful for gaining understanding of people’s behaviors and activities – what they do and how frequently. The authors further explain that observations can help to understand data which was collected through other (qualitative or quantitative) methods. I argue that verifying a model which was built from the outcomes of questionnaire and interview data in the said way adds a lot to its quality and trustworthiness.

Guest et al. (2012) summarize some important facts regarding the conduction of participant observations by saying that certain data simply cannot be

collected through other methods than (insider) observations. They also claim that a successful observer should fit into the setting without being recognized as observer, even if he does outsider-things like taking notes. Finally, the above authors confirm that the direct experience of observing enables a researcher to make positions of his data with more confidence to get it right.

Critique and limitations. When applying a certain method to benefit from its possible advantages, the researcher should also be aware of its pitfalls and limitations. This paragraph therefore takes up the common concerns against the method of observations and replies to them in the context of the research study in hand.

One frequent critique is that in order to receive usable results, observations are, or at least can be very time consuming and therefore unsuitable for many research projects. Even though a considerable amount of time was spent for observations in my case, this did not affect the study progress for the following reasons. The researcher is an active part and participant of the study setting and an insider to the professional purchasing environment at DFS. This means that conducting observations was possible on-the-job and without the need to invest much extra time or to disturb those being observed. Except for the analysis and planning of observed events, no additional efforts like traveling to the setting, preparation of the place observed or information of gatekeepers was necessary. Additionally, the research question to answer through the observations is quite focused, which means that the researcher could concentrate on just few aspects during the observation sessions and thus conduct the observations within a reasonable timeframe. These may be strong arguments that long-time observation periods or extensive and time

consuming preparations are not necessary for this study. Mack et al. (2005, p. 14) confirm that *“researchers who already possess a solid base of cultural awareness are better able to concentrate on the research question itself”*.

Another critique on the observation method is that they underlie inherent (observer) subjectivity. This means that observations and results may be influenced by the researcher’s personal belief on what is important or relevant. An inexperienced observer might take a certain point of view during the observations and put his eye on aspects only which he considers important for personal reasons. Besides, data interpretation might also be influenced through the personal appreciation and perception of the researcher as well as through his general worldview. The main point of critique here is that like many other qualitative methods, observations allow for extensive researcher bias whereas research in general demands for a more objective and neutral view. To face this critique, the researcher should be fully aware of the pitfalls and consequences of such a subjective approach. Observations and field-notes should be as objective as possible and as data analysis tends to be subjective, the researcher’s attention should be focus on unbiased interpretation of the field-notes. To support minimizing researcher bias and by this means increasing the reliability of observation outcomes, Mack et al. (2005) propose keeping the above facts in mind during the observations and especially when creating observation field notes. The authors suggest designing a field-note sheet where the notes of observation facts are strictly separated in one column and created in a particular objective way. All notes that go beyond the pure objective facts should be made in a separate area of the sheet and include all more subjective descriptions and possible interpretations of what happened.

The more general critique that observations are difficult to document is mostly grounded in the fact that when doing observations, everything must be written down quickly during or from memory after the observation session.

To facilitate note-taking during observations and to avoid above pitfalls, a uniform field note template was created to support easy and unbiased observation documentation (Annex 7). The templates were filled out during observations and directly after observations to ensure accuracy and completeness of notes. Generally, it should be noted that when the observer is part of the social world he observes and in many cases an insider to the study setting, it seems natural that researcher bias can never be completely eliminated. However, as Saunders et al. (2009, p. 297) confirm, the best a researcher can do is being “*aware of the threat to reliability it poses and seek to control it*”.

As Di Domenico and Phillips (2012) further report, observations are also often criticized for the fact that the observer’s sheer presence might influence group or individual behavior. The so called *Hawthorne-Effect* was described in the 1960’s during group observations in a company environment and addresses the phenomenon that observation participants might change their normal behavior because they know they are being observed. This and the fact that the researcher is “*placed outside his own natural environment and within essentially foreign ones*” (Mills, Durepos, & Wiebe, 2010, p. 654) might affect observation outcomes in an unwanted way. Therefore behavior of observed individuals might be unnatural or put-on in case a foreigner observes them. Reasons for this effect might be that observed persons decide to behave in a way they anticipate is correct, appropriate or expected by the (outsider)

researcher or other stakeholders. Critics also claim that observations which are conducted in unknown or unfamiliar environments are more likely to lead to wrong conclusions compared to observations of settings familiar for the observer.

It can be said that for the study in hand, the danger of above effects could be minimized. As described earlier, the researcher is part of the studied population and a trusted and appreciated colleague since years. As confirmed by Di Domenico and Phillips (2012, p. 2) a (partially) member of the setting, which he calls bicultural observer *“provides access, trust, absorption and interpretation that [...] may more closely mirror those within the social setting than data collected by [...] an outsider”*.

Conducting observations also pose ethical challenges for the researcher. The information and obtaining consent of those to be observed is one of the most important tasks of the researcher when planning observations. He also needs to make sure that those being observed do not suffer any disadvantages through participating. Chapter 4 will describe in detail how these ethical challenges were met.

Observation type. Different types of observations are described in literature. They mainly differ in terms of what role the researcher takes and how intense his contact to the observed population is. Spradley (1980) distinguishes five types of observations, depending on the degree of researcher participation: non-participatory, passive, moderate, active and complete participation. In a non-participatory or passive role the researcher has no or only limited possibility to get in contact to those who are observed, to immerse into the setting or to be interactive with the study population. In contrast, the more

active forms of observations allow for a deeper involvement of the researcher and the possibility of interaction with the participants. More abstract, direct (non-participant) observation can be distinguished from participant observation. Whereas direct observation is described as activity of mainly quantitatively counting behaviors or events with no need to interact or even interpret the collected data, participant observation stands for a more qualitative, interactive and interpretative method with the researcher usually present at the location. Some define a difference between participating and observing: "*in the first, you remain an outsider and simply observe and document [...], in the second, you take part of the activity [...]*" (Mack et al., 2005, p. 19). However, data analysis in participant observations tends to be much more interpretative than in direct observations (Guest et al., 2012).

The observations conducted as part of the case study in hand were done with a *very high level of participation* for the following reasons. The researcher is an insider to the research environment and has a collegial or even personal relationship to most of the study participants. As DFS employee and active member and purchasing department, the researcher is an expert to the subject matters of purchasing as well as corresponding processes and regulations. For this reason, mutual trust and familiarity facilitated the researcher to take the role of an observer. As the researcher often played an active role in the business situations where observations took place, a non-participatory or mostly passive approach to observations was not necessary and also unwanted by the researcher and purchasing management. Even though the researcher was an active part of the observation settings and integrated in the study population, observing and collecting data did not necessarily require

much interaction with the persons observed, for example asking questions to explain their activities or applied competencies. The researcher status as an insider supported this approach and facilitated data collection without disturbing business. Researcher interaction during observations was not necessary to recognize important facts and to collect useful data. As participants were informed about the observations, but the actual observation situation was a common one (e.g. being together in a meeting), some of the possible disadvantages of observations could be minimized, for example the Hawthorne Effect described above.

The stages of observation at DFS purchasing department as well as the analysis of what was observed will be described in detail in Chapter 4.

4. Data collection and data analysis

To recap, this research study aims at developing and verifying a competency model for DFS purchasing professionals and to explore the role of implicit participant knowledge on competency needs. The identification and verification of competencies was achieved through a multi-phase process and study design as introduced in Chapter 3. Based on the applied methodology and methods, the following paragraphs now outline the process and results of data collection, data analysis and data integration. As described by Lenzerini (2002), in the context of this study data integration refers to the comparison and combination of data from different sources in order to provide a unified and complete view. The research plan consists of a preliminary phase, a model development phase and a model verification phase. As in each phase data was collected and analyzed, the data collection and analysis process and results are presented individually for each phase. This chapter is therefore structured according to the sequence of above study phases. Paragraph 4.1 describes how supportive (competency) data was collected during the literature review and how this data was processed for use in the model development phase. Paragraph 4.2 outlines the process and results from different steps of data collection, analysis and integration for the development of the competency model. Finally, paragraph 4.3 expands on how data was collected from participant observations to verify the developed competency model and to identify implicit participant knowledge.

The research questions as presented in Chapter 1 are answered based on the results of each above step.

4.1 Phase 1: Preliminary

Even though data collection and analysis mainly happened in the phases of model development and model verification, some supportive data was already collected during the systematic literature review for later use. However, the main purpose, approach and results of the systematic literature review are presented in Chapter 2.

The literature review not only served to situate my research project in the current body of knowledge and aimed at revealing possible research gaps. It also supported the phase of model development by identifying the literature view on purchasing competency requirements (important competency attributes of purchasing professionals). This supportive data was discussed and processed through the first Expert Forum workshop for further use in the questionnaire survey. In this way, insights from the literature review were used to support data collection in the phase of model development. I argue this approach fits to my pragmatic attitude. This way, the study makes use of earlier research results with the goal to gain an even more complete view on competency needs of the target population.

The following paragraphs outline which supportive data was collected during the literature review and how the data was processed by the Expert Forum. Data processing took place through general limitation and specific expansion of a compiled catalogue of purchasing competency attributes. The figure below shows the steps of processing the supportive data.

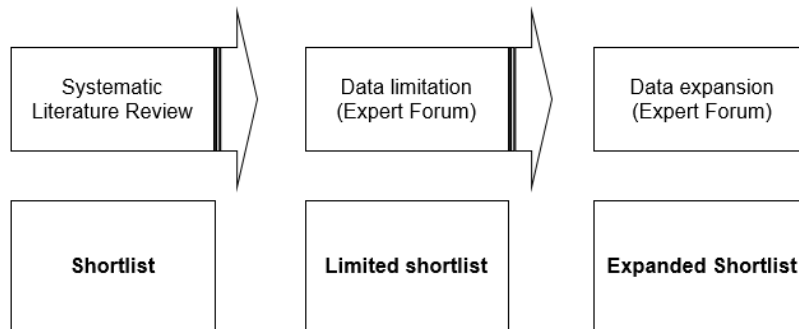


Figure 25 - Processing of supportive data

4.1.1 Using supportive data collected during the literature review

Various authors in the field of competency studies conducted research on the ideal set of purchasing professionals' competencies. Their results were gained by applying quantitative and qualitative methods to answer individual research questions from different researcher perspectives. Some authors also based their findings on personal professional experience and other evidence rather than original research. An extensive discussion on purchasing competency literature is covered in Chapter 2.

To take further advantage of these earlier research works for the study in hand, some main results and basic statements regarding purchasing competency needs of selected sources were identified and analyzed during the literature review. The idea behind this was to collect information about important purchasing professional competency needs from the viewpoint of past literature. Consequently, it was decided to generate a *catalogue of attributes* (shortlist) related to purchasing professionals competencies that reflects the literature view on this topic. The table below shows the literature sources from which purchasing competency information was collected during the literature review.

literature source	applied methods	findings (attributes)
Cavinato, 1987	interviews	<i>knowlegde of materials, production systems and technologies, materials management / inventory systems / just in time, quality systems and options, contract manufacturing, computers / automated purchasing systems, costing</i>
Dion & Banting, 1988	survey	<i>negotiation, motivation</i>
Kolchin & Guinipero, 1993	case study	<i>(18 skills identified / 4 groups) decision making, negotiation, interpersonal communication, problem solving, influencing</i>
Dowd & Liedka, 1994	survey	<i>communication, interpersonal skills, self-motivation, initiative, professional presence, leadership, analytical, problem solving, academic achievement</i>
Murphy, 1995	survey	<i>negotiation, management, computer literacy, mathematics</i>
Killen & Kamau, 1995	n.a.	<i>product knowledge, principles of purchasing and management, personal attributes, interpersonal skills, technical knowledge, analytical ability, managerial skills</i>
Cruz, Epatko, Murphy, 1996	survey	<i>supply chain management, technology, communication, strategic thinking, education</i>
Faes & Matthyssens, 1997	survey, interviews	<i>Leadership, perseverance, technical expertise, belief in company and products, creativity, ability to listen, eloquence, self discipline, initiation, good appearance, technical education, emphaty, environmental avareness, adaptability, self confidence, extroversion, interest in cultures, family stability, ego-drive</i>
Norquist, 1998	n.a.	<i>communication (price negotiation), knowledge of product, services, suppliers, market and economy; patience, contract design, confidentiality</i>
Carr & Schmeltzer, 2000	survey, interviews	<i>technical skills (computer, tools, manufacturing process, math, technical business writing, materials, blueprint reading, forecasting, MRP, inventory systems), skill techniques (analytical, communication, presentation, coordination, root cause analysis, negotiation, cost analysis, problem solving, quality management, program management, organizational skills / paperwork, time management / prioritization), behavior skills (work with suppliers / customers, detail oriented, understand other departments, proactivity, ability to follow up, flexibility, stress management, teamwork, patience, multi tasking)</i>
Guinipero, 2000	interviews	<i>interpersonal communication, decision making, teaming ability, negotiation, customer focus</i>
Guinipero & Percy, 2000	survey	<i>interpersonal communication, decision making, teamwork, analytical, negotiation, managing change, customer focus, influencing and persuasion, strategic thinking, understanding business conditions, problem solving, conflict resolution, structuring supplier relationships, leadership, computer literacy, managing internal customers, creativity, organization / time management, tactfulness, inquisitiveness, written communication, supply base research, risk taking, supplier cost targeting, salesmanship, computational, technical, technology planning, specification development, blueprint reading</i>

literature source	study type / methods	findings (attributes)
Faes, Knight, Matthyssens, 2001	n.a.	<i>5 buyer profiles: "Go-Getter", "Classic Negotiator", "Caretaker", "Traditional Buyer" and "Technical Expert"</i>
Guinipero & Handfield, 2004	focus group, survey	<i>ethics, negotiation, decision making, interpersonal communication, common sense, ethics, influencing and persuasion, decision making, problem solving, conflict resolution, additional in future: (team skills, strategic thinking, leadership)</i>
Mulder, Wesselink, Bruijstens, 2005	n.a. (adapted from Hoekstra & Van Sluijs (2000), and adapted to the field of purchasing). Source: Hoekstra, H. A. and Sluijs, E. van (2000), Management van competenties. Van Gorcum: Assen.	<i>intergal thinking, analytical, generalising, information management, financial management, customer orientation, negotiation, advising, networking, legal</i>
Guinipero, Denslow, Eltantawy, 2005	focus group, questionnaire	<i>managing risk, decision making, planning, interpersonal communication, influence and persuasion, internally motivation, creativity</i>
Murphree, 2006	interviews	<i>supply chain management, logistics, finance, academic achievement</i>
Guinipero, Hanfield, Eltantawy, 2006	literature review	<i>team building (leadership, decision making, influencing and compromising), strategic planning (project scoping, goal setting and execution), communication (presentation, public speaking, listening, writing), technical (web-enabled research, sourcing analysis), d. financial (cost accounting, making the business case)</i>
Moorhouse, 2006	survey, interviews	<i>internal selling, influencing and persuasion, change management, stakeholder / relationship management, negotiation, communication</i>
Wesselink, Smulders-Dane, 2008	literature review	<i>systematic thinking, embracing diversity and managing risk, balancing global and local perspectives, meaningful dialogue and developing a new language, emotional awareness, responsibility for job performed, emotional intelligence to emphasize with values and feelings of others, systematic view on the things that have to be done, vision about long term developments of society and the organisation's position, personal commitment to realize sustainability, decisiveness, fore-sighted thinking, interdisciplinary work, cosmopolitan world view, trans cultural understanding, participatory skills, planning and implementation, capacity for empathy, compassion and solidarity, self-motivation and ability to motivate others, reflectiveness</i>
Bayen, 2010	survey, focus group	<i>strategic thinking, ability to work in teams, supplier market analysis, influencing / persuasion, total cost of ownership, integrity, listening, purchasing category strategy, market knowledge, change management</i>
Basheka, 2010	survey	<i>strategic analytical skills, tactical-technical procurement skills, management skills, analytical operational skills</i>

Table 1 - Sources used to compile shortlist of competency attributes

In most of the above sources, purchasing competency attributes were easy to identify. Many authors concluded their work with an analysis of the most important purchasing competencies or at least some generic statements on essential competency needs in the purchasing profession. However, as most authors chose different definitions and wordings for their subject of enquiry, the generic term *attributes* was chosen to cover all related terms used for purchasing competencies, skills, knowledge, behaviour, abilities, habits, personality traits, motives, values, etc.

Most original research studies identified provide a top list or compiled set of purchasing related attributes which could be directly transferred to the shortlist. To identify as many attributes related to purchasing professionals as possible, an Excel file was set up where all found attributes could be collected. Many of these attributes appeared in multiple variations, similar wordings and related formulations. For example, the later coded attribute *teamwork* appeared in multiple forms such as *ability to work in teams*, *joint work*, *team skills*, *collaboration skills*, *working in teams*, *team ability*, etc. To keep the shortlist precise and manageable and in order to prepare the data for further use, a process of sorting, matching, clustering and finally coding of the various attributes was necessary.

Coding of data means transformation and preparation of collected raw data into a new and classified form. Such codified data can be processed much easier and also analyzed automatically by using computer software (Saunders et al., 2009). The choice for Excel support was made because a tool was needed where all raw data could be easily entered, neatly displayed,

comfortably compared and arranged when sorting and clustering the original answers.

After transferring the raw data to Excel, the coding process took place in several steps. First, unnecessary filler words were deleted, for example *ability to work in teams* or *team skills*. Then, all data was brought into alphabetical order to create a better overview and starting point for the next coding steps. These were the identification of doubles and the creation of clusters to assign equal or closely related attributes where possible. Finally, superordinate terms for the defined clusters were defined. The data coding was done by the researcher only, which ensured homogeneity and consistency of the coding process and results.

Through this process, the collected raw data was synthesized to a shortlist of 26 purchasing related attributes. This first catalogue of purchasing competencies reflects on a high abstraction level the aggregated findings from the literature on competencies that purchasing professionals should have. It is no surprise that this shortlist consists of mostly generic attributes (66%). The reason for this is that the pool of analyzed literature review findings contained more than 85% generic attributes and only few and sometimes very specialized context-specific, functional competency attributes. These context-specific, functional purchasing attributes were identified in the very few existing studies on *industry specific* purchasing professional competencies. However, as Figure 26 below shows, not all attributes were finally kept in the shortlist.

<i>analytical thinking</i>	<i>common-sense</i>	<i>communication</i>	<i>computers</i>	<i>convincability</i>
<i>creativity</i>	<i>customer orientation</i>	<i>decision making</i>	<i>ethical</i>	<i>controlling</i>
<i>integrity</i>	<i>interpersonal</i>	<i>learning</i>	<i>materials</i>	<i>mathematics / statistics</i>
<i>motivation</i>	<i>negotiation</i>	<i>problem solving</i>	<i>processing technology</i>	<i>production systems</i>
<i>strategic purchasing</i>	<i>quality systems</i>	<i>structured working</i>	<i>supply chain management</i>	<i>teamwork / cooperation</i>
<i>technical</i>				

Figure 26 – Competency shortlist

The attribute *supply chain management* as generic term for a whole discipline in economics was considered too broad and undefined for reasonable use and was therefore deleted. Also, the attribute *common sense* was considered too unspecific for further use in this competency study. Common sense is understood as the average sanity or intellect of a person – an attribute which the author believes should not show up in a competency model for a specified, professional group. Thirdly, the term *strategic purchasing* is considered a highly collective term, and it was decided to split it into 12 attributes that generally relate to strategic purchasing. Through this, the information that competencies in strategic purchasing are important is not lost.

<i>purchasing processes</i>	<i>material group management</i>	<i>supplier management</i>	<i>procurement marketing</i>
<i>supplier evaluation</i>	<i>frame agreements</i>	<i>purchasing of capital goods</i>	<i>purchasing of services</i>
<i>materials logistics</i>	<i>key performance indicators</i>	<i>purchasing strategy</i>	<i>needs analysis</i>

Figure 27 - Additional 12 strategic purchasing attributes

Summarized, 35 attributes were identified from the above literature sources and formed the initial shortlist. The next paragraph outlines how the shortlist was processed through the Expert Forum to be used in the model development phase. The shortlist was processed in two steps. Firstly, it was considered necessary to identify and eliminate those attributes which are assumed to be of no relevance for DFS purchasing. Secondly, the shortlist should be expanded through adding DFS specific attributes. Both above steps were part of the first Expert Forum workshop (see also Figure 25).

4.1.2 Expert Forum workshop 1

The first Expert Forum workshop pursued the following goals:

- Limitation of competency shortlist by eliminating attributes with no relevance to DFS purchasing
- Expansion of competency shortlist with DFS specific attributes and preparation of data for use in the model development phase
- Discussion and agreement on standard key term definitions for further use throughout the research study, thesis writing and communication
- Additional idea finding on DFS purchasing competency model development process through brainstorming

4.1.2.1 Shortlist limitation

In order to raise the applicability of the shortlist for the competency study in hand, the attributes were evaluated for their relevance in DFS purchasing. The goal was to possibly identify those attributes with no relevance to DFS purchasing which could therefore be eliminated from the shortlist. As method for evaluation, the Forum members prioritized the individual attributes according to their relevance for DFS purchasing. All Forum members were asked to weight values to the different attributes according to their relevance from their individual perspectives. Each member had 100 points to assign to the different attributes.

The data limitation was conducted because it was considered possible by the author that some of the shortlisted attributes had no significance for DFS purchasing professionals at all. This seemed obvious because some attributes were gained from study works with very unique and (industry) specific

viewpoints. Consequently, it might be possible that some of the attributes would be evaluated as irrelevant by the Expert Forum and could be eliminated to keep the shortlist clean. It was assumed by the researcher that completely irrelevant attributes would be rated with zero points by the Forum members.

Mathematische Fähigkeiten	3
Computerkenntnisse	5
Kritisches / analytisches Denken	5
Lernfähigkeit / Willen zu Lernen	6
Problemlösungsfähigkeit	5
Überzeugungskraft	5
Entscheidungsfähigkeit	5
Arbeitsfähigkeit	5
Richtungsorientierung	5
Strukturiertes Arbeiten / Planung	7

The above procedure resulted in four different evaluations (one per Forum member) which were then combined to an overall view.

However, the combined participant evaluations showed that the above assumption could not be confirmed and the goal to substantiate (limit) the shortlist could not be achieved. It turned out that even the most specialized attributes from the shortlist received points in the evaluation. This means that none of the shortlisted attributes was considered completely irrelevant for DFS purchasing from the Expert Forum view. Even though the combined evaluation revealed that four of the 35 attributes received only very few points, they were not considered completely irrelevant. To not risk losing any DFS-relevant attributes in this early stage of data collection, it was decided to keep them on the shortlist. An alternative might have been here to delete those attributes with just few points, but then an informed decision for a limit and argument why attributes below this limit can be deleted would be necessary – which was considered difficult to decide.

Summarized, the data could *not* be limited through the above method. On the one hand, it might seem that the procedure was waste of time, but on the other hand, the described result shows that the shortlist was reasonably compiled

from the literature review sources and all its contents are considered relevant for further use. The shortlist could therefore be considered as the common denominator of the literature on purchasing competencies and DFS purchasing competency needs from the Expert Forum perspective. Therefore, the main objective of the shortlist to provide a first fundamental ground for model development was achieved. However, to reflect the individualities of DFS purchasing, the shortlist now needed to be expanded through a DFS specific view purchasing and related competency attributes.

4.1.2.2 Shortlist expansion

The goal here was the DFS specific expansion of the shortlist and preparation of data to be used in the model development phase. The shortlist should be expanded with DFS related purchasing competency attributes to reflect the company specific needs from the Expert Forum perspective. To collect competency attributes related to DFS purchasing, a brain writing session was chosen as a method for data collection. Forum members were asked to brainstorm on the question: *What are the most important competencies (competency attributes) DFS purchasing professionals should have?* To make sure the Forum members focus on the most important competencies, each participant got a limited amount of 10 blank cards to capture ideas. The participants were asked not to communicate during brain writing and to use one card per attribute. The time limit was set to 10 minutes. Brain writing results were then collected and presented on a pin board for sorting, clustering, coding and discussion. Some terms on the cards had to be explained by the individual participants and assigned to existing clusters of terms or maybe

even changed in their wording to make them fit better to what the participants had in mind when writing them down. This process included lots of discussion among Forum members which had its roots in the diverse group structure, the different focus of participants and different language used in formulation. From the 50 cards generated by the Forum members, a pool of 37 attributes related to DFS purchasing professionals were coded which were not already on the shortlist of attributes.

<i>ability to change</i>	<i>ability to compromise</i>	<i>ability to understand "the big picture"</i>	<i>atc / cns systems</i>	<i>working independently</i>
<i>commercial dunning</i>	<i>contract design</i>	<i>cope with pressure</i>	<i>criticism</i>	<i>responsibility</i>
<i>deal with conflict</i>	<i>default (delivery, payments...)</i>	<i>english</i>	<i>e-procurement</i>	<i>cooperation</i>
<i>flexibility</i>	<i>goal orientation</i>	<i>identification with employer</i>	<i>joined up thinking</i>	<i>coordination</i>
<i>judgment</i>	<i>market knowledge</i>	<i>material group knowledge</i>	<i>personnell management</i>	<i>statistics</i>
<i>presentation</i>	<i>price regulation law</i>	<i>procurement / private law</i>	<i>public procurement law</i>	
<i>quality orientation</i>	<i>resource management</i>	<i>self confidence</i>	<i>sharing knowledge</i>	
<i>supplier audit</i>	<i>thinking and acting economically</i>	<i>accounting</i>	<i>purchasing of inventory materials</i>	

Figure 28 –37 purchasing competency attributes

In summary, these attributes were added to the initial shortlist as compiled from the literature sources. The result was an expanded shortlist of 72 competency attributes which could be used in the model development phase. The final shortlist of competency attributes is presented in Annex 2.

4.1.2.3 Discussion and agreement on standard key term definitions

To gain a common understanding of the case study objectives and to agree on definitions of frequently used expressions, it was decided by the researcher to discuss key terms regarding their different meanings and individual views and perceptions. Brain writing was again chosen as method to collect ideas from the Forum members. Results from the brain writing process were then discussed and analyzed. Five key terms were proposed for discussion by the researcher and presented to the forum members on a white board. The Forum members were then asked to brainstorm on the given terms and to write down

their thoughts and defining elements on cards. A time limit of four minutes per term was given and the participants were asked to prepare as many cards as possible within this time frame. The cards were then arranged on the pin board for individual clustering and discussion. The goal was to identify ideas and views and to create categories as a common base for discussions on final definitions. During the brain storming process, the moderator gave some supporting reminders on how to possibly approach the task.

Term: *Competency*

Moderator reminders: *“Please do not focus on individual competencies; concentrate on the meaning of the term, your personal definition, possible synonyms. What can be called “competency”, what are prerequisites for competency? Delimitation of the term?”*

Term: *Competency model*

Moderator reminders: *“Think about what a competency model is, what are its necessary or possible components, what is it good for and what makes it a good one, what are its potential benefits, how does it look like, how should it be developed?”*

Term: *Performance*

Moderator reminders: *“What does performance mean for you? What makes an employee a good performer? What are the benefits of good performance?”*

Term: *Top performer*

Moderator reminders: *“What is a top performer, what are a top performer’s qualities, why are they important? Is every performer a top performer?”*

Term: *Behavior anchors*

Moderator reminders: *“What are behavior anchors in the context of competencies? Who defines them, how should they be structured? Should they be incorporated into a competency model and if yes, how could it be done?”*

Examples of interim results from the brain storming session are documented in Annex 4. Discussions on the brainstorming data were recorded and re-listened by the author several times shortly after the Expert Forum to formulate

definitions on commonly agreed discussion results. The developed definitions for the terms *competency* and *competency model* are presented in Chapter 1 (key term definitions).

4.1.2.4 Brainstorming on competency modeling at DFS purchasing

The goals of this session were to collect ideas on how to possibly further design and conduct the case study at DFS purchasing department and to explore participant preferences on how the desired model itself should be structured and reasonably designed. Again, the method chosen for collecting data was brainstorming as well as recorded, moderated group discussions. The group discussion recording of 78 minutes was not transcribed, but carefully re-listened after the workshop and thematically analyzed for main statements and ideas by the moderator. Brainstorming was initialized by posing three general and broadly formulated questions by the moderator. This approach was helpful as it aimed to encourage the participants to brainstorm on the basic questions “*what do we want to do, why do we want it and how should we do it?*” 15 minutes of time were given for brainstorming and taking notes. The following questions were asked:

Question 1: “What goals do we want to achieve by developing a competency model for DFS purchasing professionals and how could we practically use the model?”

Group discussion analysis: The discussion analysis brought up that the desired model can be well imagined as an aid to orientation in competency based management of purchasing employees and purchasing management. A competency model is expected to standardize the competency needs of staff at DFS purchasing department. The model can also be imagined as framework

for designing and organizing various HR measures. It could be a basis for a common language in competency management and it is anticipated to facilitate comparison and matching of personnel requirements with employee characteristics and quality. The model should portray the competency needs of the target population and by this means support recruitment activities with clear definitions of competency needs for specific positions. Future job advertisements and job descriptions should be in line with the model. Employee development and career path decisions could be based on the model. Professional education and training measures should match the individual needs as defined in the model. The model could support specialist careers, which are currently not defined in DFS purchasing as opposed to management careers. The model could also be used as an aid for decision making in employee selection, job interviews or performance appraisals. It is assumed that these significant benefits of a competency model are achieved through a greater transparency of the competences in use in the organization. Improved transparency through a competency model is considered as one prerequisite for faithful and successful human resources management at purchasing department. The model should be oriented at the target populations tasks and activities to be of practical use.

Question 2: "How should the competency model creation process be designed and how should the final model look like?"

Group discussion analysis: The discussion analysis revealed that it might be a good choice to design the model as some kind of modular system. Such a model could be constructed as a fixed body of basic competency needs applicable for all purchasing professionals and additional modules for the

different job groups, tasks or activities within purchasing department. Depending on the specific tasks and activities of certain job groups within purchasing departments, individual competency sets could be merged to form individual competency profiles. Also, a modular system facilitates later changes of model contents and revisions. This consensus is one reason why data collection in later phases was focused on the questions of purchasing professional tasks, activities and corresponding competencies and not competencies only. The possibility to include hierarchy levels into the competency model was also briefly discussed. Additionally, the participants discussed the question whether behavioral anchors would be an important part of the desired model as they could help to distinguish different levels of performance within individual competencies. The question of defining behavioral anchors was taken up again in the third Expert Forum workshop.

Question 3: "What other aspects are considered important when setting up a DFS purchasing professionals' competency model?"

From the group discussion analysis on this question, some important statements could be summarized. Firstly, all Forum members agreed to continue model development as a multi-phase process which acknowledges different viewpoints on the topic and various sources of information on competency needs. The advantage of this process is that in every phase, data can be collected, analyzed and processed before progressing to the next study phase. This enables the researcher to better identify errors in methodology or application of methods as well as flaws in data analysis, which would be much more difficult when collecting the whole body of data at once and then starting data analysis and conclusion drawing. It was also agreed to keep the Expert

Forum alive throughout the whole process to support data collection, data analysis and model development and to keep up the idea to follow a participatory approach to model development. The Expert Forum as introduced fits very well to fulfill these tasks. In consequence, it was decided to keep the Forum as an instance and to further implement it after selected stages of data collection. Another important agreement was the need to collect competency data from various sources when developing the competency model. Analyzing only one of them was believed to result in an incomplete set of data. For example, by asking only DFS purchasing professionals about their competency needs would reflect only one perspective of a comprehensive needs analysis. It was therefore confirmed by the Forum members that a more widespread view on the topic would contribute to data quality and acceptance of and identification with the study outcomes. Most Forum members agreed that the competency model development process should not be followed without considering the views of various stakeholders and not without incorporating specific stakeholder related data. The most important groups to ask for their opinion were identified as purchasing professionals themselves and purchasing customers. As purchasing department has a supportive function in DFS, the main stakeholders are purchasing departments (internal) customers. It was considered important by all Forum members to take into consideration not only the current competency needs but also the future situation. It was therefore decided to incorporate a future aspect into data collection. Another reason for a multi-source approach might be that it would strengthen the argumentation for a single case study. Criticisms could arise in case the data basis would be too small.

Furthermore, the aspect of implicit knowledge was brought up by the moderator to see whether Forum members agree that it is of importance for the competency model. It was discussed how the question of implicit participant knowledge on competencies of purchasing professionals can be acknowledged in the competency model. The Forum members agreed that the aspect might be of high importance and should be incorporated in the data collection and analysis process. It will be interesting to see whether the purchasing professionals' statements about competency needs match their customer's views and expectations on the one side, and their own implicit knowledge on competencies on the other side. Research question C as well as the methodology and method formulation was concretized accordingly.

4.1.3 Phase 1 findings summary

The findings from research phase 1 are summarized in this paragraph. Firstly, the preliminary phase served to prepare the model development phase by creating a comprehensive shortlist of purchasing attributes. The final shortlist consists of 72 attributes and was compiled from the aggregated literature review results and a brainstorming session of the Expert Forum members. Secondly, some key term definitions were developed in the first Expert Forum workshop. The definitions were compiled from the results of participant brainstorming and following discussions. As a working result, they reflect the common participant view on essential topic related aspects and frequently used terms and thus further support development of the competency model. Some of the developed definitions are presented in Chapter 1 of this thesis. Thirdly, phase 1 served to explore the Expert Forum's views on selected questions on the general topic of competency modeling. These views, ideas and expectations were considered in the later phases of my competency study at DFS purchasing department.

In summary, the goals of the first study phase to review and extract competency information from the reviewed literature and to discuss the purposes of developing a competency model were achieved.

4.2 Phase 2: Model development

Study phase 2 served to develop the competency model by collecting and analyzing quantitative as well as qualitative data. Quantitative data was collected through a questionnaire and qualitative data was collected through expert interviews. The following paragraphs introduce the target populations, followed by the method structure, and then describes the processes of data collection and data analysis along with the analysis results. Annex 8 provides an overview chart of the applied methods in each study phase.

4.2.1 Questionnaire

As defined in Chapter 1, the questionnaire serves to answer the first research question.

What are the competency requirements of DFS purchasing professionals?

Sub-questions

- *What are the actual tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

4.2.1.1 Target population and participant information

The questionnaire was distributed to all DFS purchasing professionals, 36 in total. Prior to personally handing over the questionnaires, all potential participants were invited by email to attend the study as well as a personal information meeting. The invitation also included a study concept paper with basic information on the study purpose and goals. During the information meeting, all potential participants were personally informed about the study

background and informally asked whether they could imagine to support it. The formal invitation, personal talk and written information served to inform and convince the target population about the study purpose and impact, allay possible fears and to answer questions of the potential study participants. The information meetings at the participant's offices took about 15 minutes each. The author decided to invest this time to attract participant interest and possibly ensure high trust and support of the case study.

4.2.1.2 Informed consent, reminders and response rate

The informed consent letter and declaration form (Annex 3) was personally handed over to the study participants along with the questionnaire at 01.03.2013. The potential participants were asked to fill out the questionnaire and to sign the informed consent declaration within three weeks. Reminders were sent out via email one week, three weeks and eight weeks after questionnaire distribution. The response rate progress during a 12 week timeframe is shown below.

Timeframe since distribution	response rate	
N = 36	S (%)	S
1 week	47%	17
<u>Reminder 1</u>		
2 weeks	61%	22
3 weeks	61%	22
<u>Reminder 2</u>		
4 weeks	72%	26
6 weeks	78%	28
8 weeks	83%	30
<u>Reminder 3</u>		
12 weeks	89%	32

Figure 29 - Questionnaire response rate (N = population; S= sample size)

Questionnaire feedback was mainly submitted by directly handing over the completed questionnaires and informed consent declaration (95%) or, in few cases, by sending them via DFS in-house mail system (5%). Two questionnaires were handed in anonymously.

The questionnaire response rate was high which might be expected in an in-house survey. One week after distribution, the response rate was 47%. After a first reminder (email), the response rate raised to 61%. However, three weeks after distribution, the response rate had stagnated at this level. This issue was discussed with purchasing management and the chief purchasing officer proposed to send a formal reminder to all purchasing professionals via the chief secretary. Even though such measure certainly would have further raised the feedback rate immediately, the researcher decided against it. The reason for this was that management involvement might have put pressure on the participants and maybe would have influenced the study results in an unwanted way. Participants might even lose confidence in researcher independence and voluntariness of study participation. Such measure could have destroyed the high level of trust which was built up during the questionnaire preparation and distribution phase and even cause resistance against the project. In the worst case, some annoyed or anxious participant could decide to actively resist such reminder and for example involve some third parties like high level management or DFS works council to check whether employee rights might have been violated. This could have significantly delayed the research project.

To avoid all these possible drawbacks, the researcher decided to invest more time and personally remind the colleagues and kindly ask them for their kind

contribution. As Figure 29 above shows, this measure was successful and the response rate raised to 83% during the following five weeks. A final and again more formal reminder was sent out by the researcher via email eight weeks after questionnaire distribution.

Reactions on both the personal and formal reminders were almost immediate and often accompanied with excuses and justification of the delay due to time pressure or work overload. 12 weeks after the questionnaire distribution, the response rate was 89%. Even though Lucia and Lepsinger (1999) note that a statistically valid sample size for a total population of 36 would be 33 (92%), the author decided not to send out a fourth reminder. The reason for this is that from the four not responding purchasing professionals, one had sadly passed away, one other was part of the Expert Forum and two had signalled early that they have no interest or no time to participate. However, one additional questionnaire was filled out by a new colleague who took up his job at purchasing department in early 2014. This finally raised the response rate to 91,6%.

4.2.1.3 Questionnaire structure and contents

The questionnaire consists of three parts, of which all three parts had to be completed by all participants.

Questionnaire part A served to collect demographic data. This includes data about the participant's experience levels in purchasing, job categories and professional training habits. The demographic data was collected to support the following questionnaire parts with personal and background information about the target population. It also forms the basis for possible clustering,

comparisons and identification of different target population perspectives. It serves to draw conclusions and cross connections regarding participant demographic attributes. By using demographic information, cross-tabulation and comparing of clusters becomes possible. Even if it might not be part my research questions, it will be interesting to see how responses vary between different (demographic) groups.

Questionnaire part B collects information on purchasing professionals' tasks, activities and competency needs. Participants were asked to provide the information based on own experience and according to their individual job position at DFS purchasing department. When designing the questionnaire, it was necessary to decide whether participants should have full freedom to formulate own answers or whether the questionnaire should include predefined answers. Both possibilities were considered useful and it was decided to include both methods in different parts (B and C) of the questionnaire.

For questionnaire Part B, it was decided to collect the information on purchasing tasks, activities and competency needs as free text and without giving the participants fixed options to chose from. The advantage here was that the participant answers were not limited to predefined answers and could therefore result in new and not expected data. Predefining questionnaire answers might have limited the participant's options to express their knowledge on competency needs. Instead, all information had to be entered into a custom made, three-level-diagram (Figure 30). Each questionnaire included four blank diagrams.

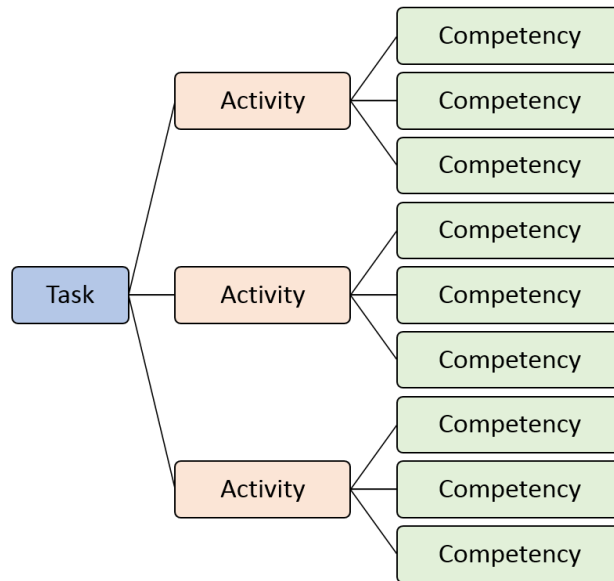


Figure 30 – Questionnaire part B 3-level-diagram

First, the participants were asked to specify the most important tasks they have to fulfill at DFS purchasing department. It was made clear that the most important tasks are not necessarily the task performed most frequently, but those whose fulfillment are of highest relevance to reach individual position goals. Answers should be entered into the blue diagram fields. Then, for each provided task the three most important activities had to be filled into the red diagram fields. Again, the most important activities are not necessarily those performed most frequently, but the ones which were considered crucial to successfully perform the corresponding tasks. Finally, the participants had to state the most important competencies necessary for their individual activities.

The term *competency* was purposely not pre-defined by the researcher for the questionnaire as this might have limited the scope of possible answers and maybe drive answers into certain directions. The participants were free to choose any attributes for competencies, skills, knowledge, behaviour, abilities, habits, personality traits, motives, values, etc. they consider crucial to possess for their activities at DFS purchasing department. Interpretation of the

competency term was up to the distinctive definition and understanding of the individual participant. As mentioned earlier, the reason for analyzing purchasing tasks, activities and corresponding competency needs is that this study aims to identify activity specific competency needs. As a job role or function in DFS purchasing is defined by the tasks an individual has, the identification of individual purchasing activities under the given tasks as well as the activity-related competency needs is considered crucial when collecting data for competency modeling.

Questionnaire part C was designed to collect additional information on competency needs from the participants. It aimed at collecting role specific information on competency needs and at exploring the relevance of the shortlisted competency attributes for the individual participants in their current position at DFS purchasing. This means that competency information in Part C was collected from the more holistic perspective of the participants in their individual job role, and not in a breakdown from purchasing tasks and individual activities as it was done in questionnaire part B.

The latter was achieved by integrating the final shortlist of competency attributes as compiled from the literature review and first Expert Forum workshop (Annex 2). The shortlist was presented to the target population in the form of two tables. The participants then had to rate the pre-defined competency attributes regarding their relevance for their individual job role in DFS purchasing department. The ratings could be provided by using a five point likert scale which covered different levels of importance from *extremely important* to *unimportant*. Questionnaire part C will be described in more detail further down in the questionnaire analysis.

<i>extremely important</i>	<i>very important</i>	<i>moderately important</i>	<i>less important</i>	<i>unimportant</i>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 31 – Questionnaire part C likert scale

4.2.1.4 Questionnaire analysis

The three questionnaire parts as described above were analyzed separately. The demographic participant data from questionnaire part A was analyzed using statistical analysis software grafstat. Questionnaire Parts B and C were each analyzed in two steps. First, Microsoft Excel served as a tool for preparing the questionnaire raw data in terms of data coding. In a second step, grafstat was used to analyze the coded quantitative data.

Questionnaire Part A – Demographic data

In two of 33 returned questionnaires, part A was not filled out (6%). Consequently, part A analysis is based on a feedback sample size of 94%. The analysis brought interesting insights which could later help to better understand the collected competency data or draw conclusions from the overall results.

Career Level. One interesting find is that about 35% of DFS purchasing professionals work in positions with either personnel responsibility or operational (non-disciplinary) leadership responsibility (*management* or *consultant level*). 50% have reached an expert level and 10% work as purchasing specialists. The remaining 5% are basic level employees in mostly supportive functions. These career levels are closely linked to the individual job profiles of DFS purchasing professionals and the department's salary structure.

Work experience at DFS purchasing department. More than 60% of purchasing staff works at DFS purchasing department for more than 11 years, 25% for more than 20 years. 15% of purchasing staff are newcomers with up to 3 years working experience. These numbers clearly indicate that labour turnover rate at DFS purchasing is very low. Almost 70% of DFS purchasing professionals have no or only very limited work experience in other company's purchasing departments. Almost 30% did not work in other purchasing environments at all. Interestingly though, only 15% of the senior and very DFS experienced employees work in purchasing management positions.

Educational background. Almost 70% of purchasing personnel at DFS graduated school with an A Level, of which 94% have later completed a bachelor degree. Almost 70% of the achieved bachelor degrees are business administration, economics or related degrees such as business informatics. Only 10% of the bachelors also graduated with a master degree. More than 90% of the participants without bachelor or master's degree earned an apprenticeship certificate in a commercial discipline. From the analysis of the participant's educational background, some interesting conclusions can be drawn. Firstly, it can be noted that most of the university studies or apprenticeships were in fields that were not related to any technical or engineering discipline. On the first sight, this might sound logic for purchasing staff. On the other hand, DFS is a very technology oriented company² with purchasing department involved in plenty of projects with a strong technical focus and background. It is surprising that there is virtually no technical expertise at DFS purchasing department in terms of educational background

² See also statement of DFS CEO (DFS, 2015).

or professional training. We will see later when analyzing purchasing customer interviews how their expectations regarding technical knowledge of purchasing professionals is and whether or not it fits to the current situation.

Professional training and development. 100% of the respondents stated that they already attended in either internal or external professional training activities. Surprisingly, only 15% are planning to attend additional training activities within the next 12 months. One reason for this could be that people who did training in the past did it to reach higher career levels and are now satisfied with their progress and so stopped planning additional activities. The above could also be explained by assuming that people fail to set up long term training goals or identify training needs and plan necessary training activities. It could be concluded that training activities are done spontaneously, unplanned and maybe just to reach short term goals or fulfill agreements made with management. One positive effect of competency modeling at DFS purchasing department will be that it supports professionals and management in identifying training needs and assist them in better planning long term training activities and goals.

Generally, it can be said that the participant rate of external training activities (90%) is significantly higher than the rate for internal training activities (60%). There are several possible reasons for this. Firstly, external courses might be more attractive for participants because they often require travelling and off-site accommodation, which is a popular activity. Another reason might be that DFS internal training programs and opportunities do not match the needs and interests of purchasing staff. It might also be possible that people have reservations against in-house trainings because they do not want colleagues

to know and see what training they do and how they perform during training activities, for example when training presentation skills or language skills.

It could be of advantage to change this situation and to foster internal training activities because external training is much more expensive than internal courses. Furthermore, DFS has a professional training infrastructure (DFS academy) which can be used for staff training. Consequently, there are ideal prerequisites for setting up an internal purchasing training curriculum. However, in order to identify the competency and training needs of purchasing staff and to plan professional development activities, a competency model is necessary.

Even though there are professional training opportunities such as the German *Fachkaufmann Einkauf und Logistik* or the international *Certified Purchasing Manager* and DFS supports such training measures financially, only 10% of purchasing professionals successfully graduated in a purchasing specific and long term training program. This raises the question why there is so little motivation to attend subject specific training.

Also, self-study activities are fairly unusual among DFS purchasing professionals (30%) and normally involve legal topics (50%) and electronic buying systems (30%). It is noticeable that purchasing or business related topics and buying-market or technology related measures are virtually not existent (10%). What stands out most from the analysis for training topics is that there is a huge imbalance between internal and external activities with purchasing and business administration related contents. Whereas more than 50% of DFS purchasing professionals attended external training activities in said subjects, only 10% visited relevant internal courses. This might be a

strong indication that internal courses with business and purchasing related contents are not adapted to individual employee requirements. The same is noticeable regarding legal training courses such as private or commercial law, public procurement law or drafting and negotiation of contracts.

Questionnaire Part B – Purchasing tasks, activities and competencies

As described above, questionnaire part B included four diagrams to be completed by the participants. For the first diagram level, participants were asked to enter the most important *tasks* they have to fulfill at DFS purchasing department. When proceeding with the next diagram level, participants could fill in up to three *activities* per task. Finally, up to three *competencies* per activity could be entered when filling out the last diagram level. Summarized, one questionnaire feedback could result in raw data of up to four tasks, 12 activities and 36 competencies.

Analysis of purchasing tasks

For the analysis of DFS purchasing professionals' tasks, Microsoft Excel and grafstat software was used. In a first step, the raw data on purchasing tasks was transferred to Excel by hand and double checked for flaws in the transcription (handwriting to typescript) by the researcher. As the participants were free to formulate their purchasing tasks in the diagram fields, data coding of individual answers was necessary in the next step. The goal here was again to facilitate the data for further processing. Without data coding, a reasonable analysis of corresponding purchasing activities and competencies would not have been possible as the coded data was later analyzed statistically with grafstat. Again, an example might help to provide a better understanding for

this very time consuming work. One of the purchasing tasks which was coded from the questionnaire raw data was *team coordination*. To code this task in the first place, several different expressions, variants or related terms for team coordination had to be identified and assigned to a cluster of similar tasks. In order to reasonably identify all relevant raw data and cluster them under one suitable term, it was necessary to display all raw data on a large Excel table to compare, sort and match the data with the goal to identify similarities and differentiations and possibly to develop a suitable collective term. This collective term could then be used as a code for later steps in data analysis and model development.

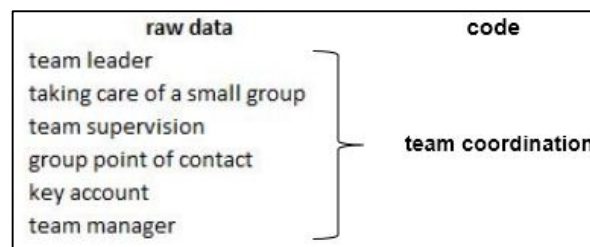


Figure 32 – Example step in data coding: task team coordination

In a first step, 81 pieces of task raw data were identified from the first level fields in the diagram and transcribed to Excel. As shown in the example above, the raw data was processed for further use in the process of model development. In total, a number of seven task clusters were coded from the task raw data. These seven clusters of tasks were coded with the capital letters A to G. Figure 33 below shows the explored purchasing tasks along with their individual codes.



Figure 33 - coded purchasing tasks

Analysis of purchasing activities

The next step aimed at analyzing the main purchasing activities of the target population. With the help of the diagram as introduced above, the most important activities per quoted task were identified. A total of 218 task-related activities were collected from the questionnaire feedbacks. Under the collective terms for the tasks all the quoted activities were grouped. So in the above example if someone put 'group point of contact' as a task, all the related activities for that would be added to 'team coordination'.

As with the analysis of tasks, the activity raw data included a huge number of doubles, similar or only slightly different expressions for the same activity and thus needed to be processed in terms of coding. Therefore, all activity raw data was again transcribed to Excel and analyzed to identify clusters of similar and closely related activities. The identified clusters of activities were then coded with cluster specific terms and assigned to an individual combination of capital letters. In this way, 20 activities were identified and assigned to the individual task under which they were originally quoted.

For the task team support, the following activities were identified and coded:

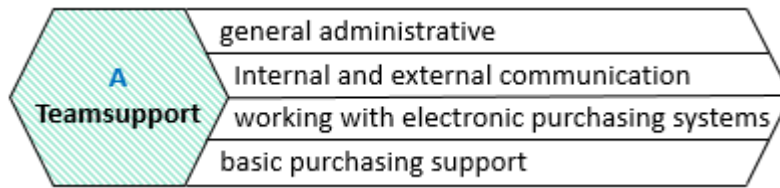


Figure 34 - Team support activities

For the task purchasing level 1, the following activities were identified and coded:

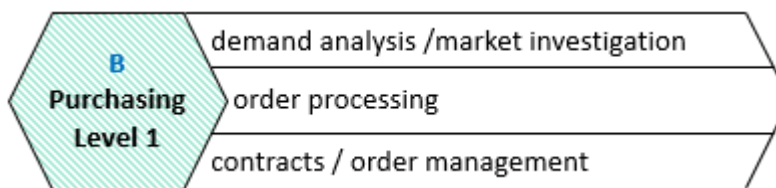


Figure 35 - Purchasing level 1 activities

For the task team coordination, the following activities were identified and coded:

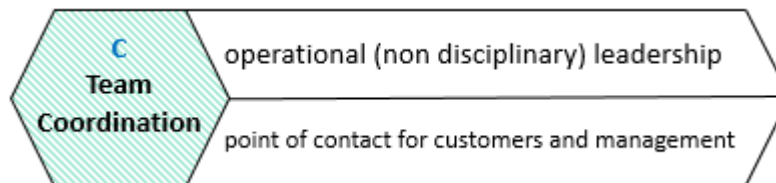


Figure 36 - Team coordination activities

For the task purchasing level 2, the following activities were identified and coded:

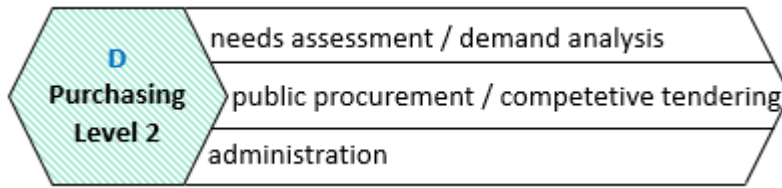


Figure 37 - Purchasing level 2 activities

For the task organizational matters, the following were identified and coded:

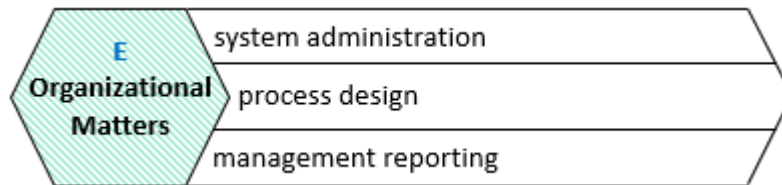


Figure 38 - Organizational activities

For the task leadership, the following activities were identified and coded:

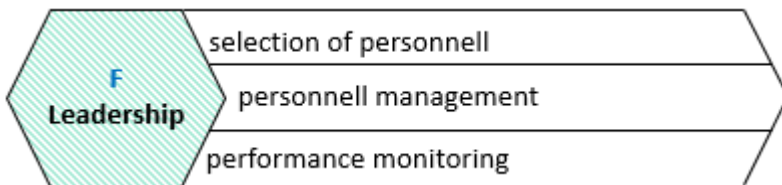


Figure 39 - Leadership activities

For the task purchasing level 3, the following activities were analyzed and coded:

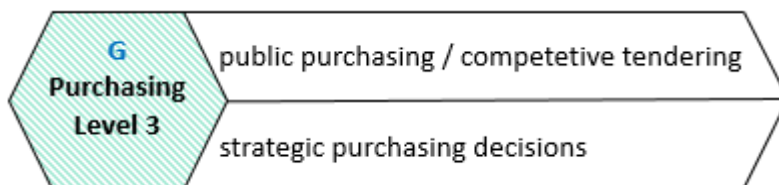


Figure 40 - Purchasing level 3 activities

Analysis of purchasing competencies

In a final step of analyzing questionnaire Part B, DFS purchasing professionals' competency needs for the now coded purchasing activities were examined. Looking back at the diagram, participants were asked to state the three most important competencies per activity they perform at DFS purchasing department. This means that up to 36 competencies were collected per questionnaire, depending on how many diagrams the individual participants completed. Multiple quotes of one competency were possible, for example when participants considered a certain competency important for more than one of their activities. A total number of 602 competency quotes were collected from the questionnaire feedbacks for analysis (raw data).

The competency analysis turned out to be very time consuming and required some decisions to be made by the researcher. First, some generic raw data like *expertise*, *skillful*, *experienced*, and *studied* were excluded from further analysis. This was necessary because such very generic attributes are impossible to cluster or assign to specifically coded activities. Consequently, it was decided to exclude the data as extensive researcher interpretation in such cases might have falsified coding results.

It seems worth noting here that the use of such vague and unspecific wording to describe competency needs might be a first indication for the existence of implicit participant knowledge on competency needs. The respondents might have found it difficult to formulate their actual knowledge on competency needs and used the above words to express what they think. The aspect of implicit participant knowledge will be discussed later in more detail.

By using Excel, the sorting, matching and clustering of equal or closely related attributes allowed narrowing down the extensive list to competency attributes in the next step. Through this process, 29 common attributes were identified, coded and assigned to numbers from 1 to 29. Table 2 below presents the competency attributes as coded from the raw data for further use.

Competency	Code
proactivity / goal orientation / time management	1
sense of responsibility / reliability / quality orientation / organizational communication (written and oral) / office communication systems / self-confidence / quick-wittedness	2
basic purchasing knowledge (processes and methods) / focus on competition and economic efficiency	3
ERP systems (SAP)	4
analytical	5
customer orientation	6
ability to deal with conflict / ability to take criticism	7
ability to learn / further develop / change	8
purchasing law	9
drafting of contracts	10
english language (written and spoken)	11
affinity in numbers	12
commodity, marketplace and supplier structure expertise	13
negotiation / persuasiveness / ability to compromise	14
cooperation / social	15
flexibility / cope with pressure	16
motivational capacities	17
public procurement law	18
decision making	19
creativity	20
programming	21
knowledge sharing	22
integrity / identification with employer	23
cognitivity / knowledge of human nature	24
interest in employee decisions	25
perfectionism	26
labor law	27
keen perception	28
	29

Table 2 - coded competency attributes from questionnaire part B

Identification of most important competencies per activity

In order to rate competencies, their importance can be measured in terms of frequency of use. By measuring competency importance, their criticality within a particular professional discipline can be demonstrated. Measuring competency importance shows how often professionals apply them to perform certain jobs (Hamel & Prahalad, 1989). In the next step of data processing, grafstat was used to quantify the identified competencies and to identify their priority. The goal here was to identify a ranked order of competency needs per identified purchasing activity. The analysis revealed the frequency of quoted attributes per activity. With these results, a ranking of competency needs per activity under the specific tasks was generated. These rankings were later used as a basis for the development of the competency model.

To avoid including low priority competency information to the model (low frequency of responses), another decision was made by the researcher. In order to identify the most important competency information, only those competency attributes with the highest priority were kept in the data basis for further use in the competency model. The competencies with the highest priority are those which were quoted most frequently. To systematically identify those competencies that should be deleted from the catalogues, the lower prioritized competencies were identified through calculating their deviation from the arithmetic mean of attribute importance (standard deviation). Only above average important competencies were kept in the catalogues. An Example of this data processing is provided on the next page.

Example: activity order processing

For the activity *order processing*, 16 important competency attributes were identified. As shown in figure 41, the competency attribute with code 3 (communication... , see table 2) was identified as the most important one here because no other attribute was quoted more often under this activity. The least important attributes (coded 1, 2 and 17) were quoted only once each for this particular activity. The average priority was identified by determining the arithmetic mean of responses per attribute. In order to identify the over average important attributes, the individual standard deviation per quoted attribute was then calculated. Finally, all identified attributes with a negative value (deviation from average value) were identified as below-average important for the activity under investigation. These lesser important competencies were then deleted (marked red).

order processing	coded competency	quotes	arithmetic mean	standard deviation (σ)
	3	13	4,38	8,63
	5	9	(average priority)	4,63
	16	8		3,63
	15	6		1,63
	4	5		0,63
	10	5		0,63
	14	5		0,63
	6	4		-0,38
	8	3		-1,38
	11	3		-1,38
	12	2		-2,38
	18	2		-2,38
	19	2		-2,38
	1	1		-3,38
	2	1		-3,38
	17	1		-3,38

Figure 41 – Competency prioritization example *order processing*

The result of this procedure was a limited catalogue of important competency attributes per identified activity. Sometimes, an already small group of

attributes was even more limited through this procedure, for example when only 3 different attributes were quoted as important under a specific activity and one of them was quoted with a low frequency compared to the others. However, it was decided by the author that even though some activities were strongly limited regarding their competency information in this step, a consistent treatment of all activities was important in terms of a coherent methodology. Besides, it was considered necessary to keep the competency information per activity manageable at this early point as during the next steps of model development, a lot of additional information might be identified to expand the drafted model.

Interim results from analysis of questionnaire part B

Through analyzing and coding the questionnaire raw data on DFS purchasing tasks and activities, the *seven most important purchasing tasks* at DFS purchasing department (from a purchasing professional perspective) were identified (Figure 33, p. 248). Subsequently, *the most important activities* performed under the identified tasks (from a purchasing professional perspective) were explored. Two to four main activities were identified per task (Figures 34 – 40, p. 249 - 250). Furthermore, a coded catalogue of competency attributes was developed and used to assign the competency information to the now coded purchasing activities. This resulted in a breakdown of competency attributes per purchasing activity under the given tasks. Per activity, a catalogue of four to 17 competencies was identified, which was then prioritized through quantitative analysis.

From the analysis of questionnaire part B, the following assumptions can be drawn. The objectives to identify the main tasks, activities and competency needs from purchasing professionals' perspective were achieved. However, these interim results of competency needs still appear to be incomplete, sometimes interchangeable and unspecific. It seems that the participants did not provide enough information to build a comprehensive competency model at this stage. In some cases, even questionable information was provided (e.g. feedback was given that competencies in *personnel management* are necessary for activities from participants that have no responsibility for own personnel at all).

Building the competency model from questionnaire part B analysis only would probably not lead to a complete picture of purchasing competency needs. Thus the author believes that without collecting further data, no complete and meaningful model can be developed. Two reasons for this conclusion can be imagined. Firstly, the target population is rather small which might result in a limited or incomplete set of data. Another reason could be the presence of *implicit participant knowledge on competency needs*. Maybe by using the free text method as introduced with the 3-level-diagram, this implicit knowledge could not be explored. Maybe important information on competency needs still can be explored by using different methods of data collection. Both above considerations confirmed the author to go on and add more quantitative and qualitative data to the model. However, the data collected so far serves as useful basis for model development.

Questionnaire Part C – Additional (profile-related) quantitative data

Questionnaire part C aimed at collecting additional quantitative data on purchasing *competency* needs which can be used for further developing the desired model. As described earlier, questionnaire part C made use of the shortlist of competency attributes as compiled during the literature review.

Compared to questionnaire part B, the following differences can be described regarding the method and process of data collection in questionnaire Part C:

1. When providing competency information, participants had to choose from pre-defined answers and used likert scales for providing information. The advantage of this approach is that no additional coding is necessary as it was the case with the free text answers from questionnaire part B. The answers were pre-coded by the researcher during questionnaire development.
2. Questionnaire Part C asks for *competency* needs only, independent from individual tasks or activities. This means that the data collected here was not directly related to specific purchasing activities (as it was when collecting data using the diagram), but rather *profile*-related. Answers in part C were given from the participant's self-image of their *buyer profile*. This seems reasonable as the author considers a job profile in DFS purchasing defined through the sum of an individual's superordinate tasks. The reason for collecting additional profile-related competency information was that from the researcher's point of view, a competency model cannot be developed without considering role specific competency needs. Purchasing professionals might rate certain competency needs

important with their individual profile in mind, cross-functional and applicable for all their purchasing activities.

Questionnaire part C allows for collecting such information. In combination with the data collected from questionnaire part B, a more complete picture of purchasing competency needs is anticipated.

Summarized, the objectives of this additional collection of competency data in questionnaire part C were:

- to collect additional, profile-related competency information
- to verify the competency information from the compiled shortlist for its relevance for DFS purchasing professionals

The participants were asked to complete the questionnaire in chronological order to avoid part C information (predefined competency attributes) influencing them in describing their actual tasks, activities and competency needs in part B.

It is interesting to see to what extent the literature review findings and Expert Forum input (which was the basis to build questionnaire part C) will be confirmed by the target population. The participants might consider some additional and predefined competencies important even if they did not come to their mind when filling out questionnaire part B. As the catalogue of attributes to choose from was compiled from the literature on purchasing competencies and the first Expert Forum workshop, the chance that it includes some important competency needs for DFS purchasing professionals that were not already identified as essential in questionnaire part B is considered high. If it comes to significant new insights here, this could be another indication of

implicit participant knowledge on competency needs. When studying competencies, participants are maybe not aware of important facts until they see what *could* be important. When asked to formulate important competency needs, participants maybe *forget* to say things which they might later confirm as important when directly addressed.

Questionnaire part C analysis of competency data

Questionnaire Part C served to collect additional information on competency needs by using the catalogue of 72 competency attributes compiled from literature sources as described in Chapter 4.1.1 (supportive data). The catalogue was split in two sections. Section one contains generic competency attributes only, whereas section two contains functional attributes. Participants provided information through filling out a likert scale tables per competency attribute (see Annex 5, pages 7 and 8).

To ensure a systematic and profile related data analysis, and to allow later combination of results with part B results, part C was analyzed per *purchasing task* as identified earlier (see Figure 33). Several steps were followed to analyze part C and to combine analysis results with the results from questionnaire part B analysis. This process will be explained now for the example "*Task E – Organizational Matters*".

1. All questionnaires which stated task E under the most important tasks (diagram) were identified. In case of task E, this applies to four questionnaires.

2. From these four questionnaires, all competency attributes which were rated *important or very important* (likers scales) were identified. In this example, this applies to 31 different attributes.
3. These 31 attributes were then prioritized as described earlier (counting, calculation of average value, calculation of standard deviation, elimination of under average important attributes) (see Figure 41). The result was again a limited number of attributes.
4. These new attributes were then compared to the results from questionnaire part B analysis. As so far all competency data was identified under individual activities, the new competency attributes were added to all activities as coded under task E.

This means that in case new competency needs were identified, they were considered important for all activities under the specific tasks. Competency attributes which were already identified as important in Part B analysis were not further considered.

All new attributes identified were added to the individual catalogues of attributes per activity under the respective task. In case the competencies were already coded, the existing code was used. In case the new competencies were not yet coded, an individual code was assigned. Due to the fact that a purchasing professional profile is defined through multiple tasks at DFS purchasing, the questionnaire raw data from questionnaire part C was used to complement the existing competency data for each activity quoted. Consequently, in case one feedback was given by a person with two main tasks, all competency information from Part C was used to complement the competency data of all related purchasing activities.

Please see Figure 42 below for an overview of Part C analysis and combination with Part B results.

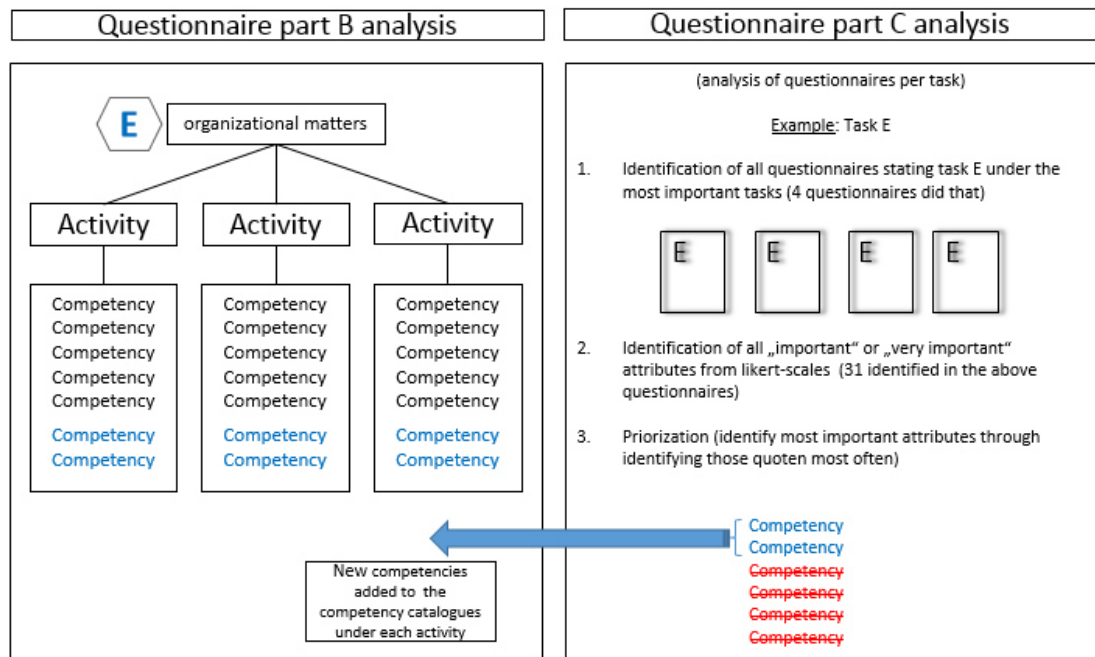


Figure 42 - Questionnaire part B and C analysis process

The table below shows all new important purchasing competency attributes as identified from questionnaire part C analysis.

procurement marketing	30
ressource management	31
atc systems	32
accounting	33
buying services	34
supplier evaluation	35
ethics	36
structured working	37
purchasing key performance indicators	38
supplier audit	39
supplier management	40
commodity / material group management	41
materials management	42
mathematics	43
quality systems	44
personnell management	45
procurement marketing	46
controlling	47
statistics	48

Table 3 – Coded competency attributes from questionnaire part C

4.2.1.5 Questionnaire analysis findings summary

After collecting demographic data in questionnaire part A, questionnaire part B analysis served to identify the seven most important purchasing tasks and a number of corresponding purchasing activities per task. It also explored the most important competency needs per defined purchasing activity. Based on the literature review findings on purchasing competency needs, questionnaire part C analysis then served to add additional competency information. From the questionnaire analysis results, the competency model for DFS purchasing professionals can now be set up.

However, even though both sets of competency data from the questionnaire were limited through calculated prioritization, the combined results (competency catalogue per purchasing activity) are still considered too extensive for reasonable use in competency model development. Up to 25 important competencies were identified per purchasing activity. Consequently, before answering research question A, a second Expert Forum workshop was conducted to further process the explored competency data. This seems reasonable as further prioritization of data through the Expert Forum will help to focus on the most significant data and to keep the body of data manageable and usable for the purpose of developing a competency model.

4.2.2 Expert Forum workshop 2

The case study's second Expert Forum workshop pursued the following goals:

- a. Information of the Forum members about study progress
Method: Presentation of questionnaire analysis interim results
- b. Processing of questionnaire results
Method: Discussion and further prioritization of existing data basis
- c. Supporting next step in model development
Method: Brainstorming on possible expert interview questions

The workshop results were documented through handwritten discussion notes, photo documentation of interactive elements (pin boards) as well as a short reflective journal. The following paragraphs describe the workshop methods and results.

- a. Information of the Forum members about study progress

The workshop started with a brief summary and presentation of the questionnaire phase by the moderator to recall what data was collected so far and what methods were used for data collection and analysis. Important milestones as well as problems and issues were presented along with the interim results as described above. This step was important as most Forum members were not yet fully informed about the study progress and outcomes of the questionnaire phase.

- b. Processing of questionnaire results

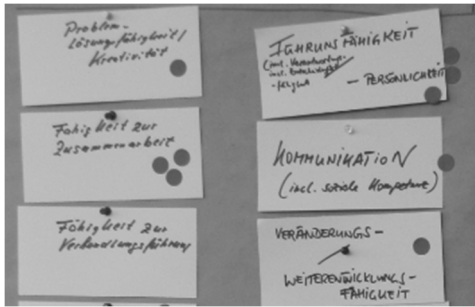
The second purpose of the workshop was to work with the existing data basis from the questionnaire analysis. The extensive questionnaire interim results as presented above were processed through discussion and further

prioritization. Basically, the main goal here were to prioritize the existing data base were necessary (limitation) and possibly collect some new data which was not already explored through the questionnaires. In this way, the Expert Forum again served as an iterative instance to process the existing database from a multi-perspective view. The following insights and results were gained from the discussion notes and data processing:

Generally, Forum members again confirmed that competency needs arise from the tasks and the individual purchasing activities and that it was thus necessary to not only collect data about competencies but also about the tasks and activities of purchasing staff.

Purchasing tasks and activities. The seven synthesized tasks and corresponding activities were discussed. It was confirmed that the chosen coding correctly represents the task areas and activities of DFS purchasing department employees. However, it was debated on the question whether the task *purchasing level 3* should be subsumed under task *leadership* as it includes activities of purchasing management only. Arguments were collected and balanced and it was decided to keep *purchasing level 3* it as an own task, but to keep in memory that consolidation is possible here in case facilitation of the final model structure becomes necessary. The reason for this decision was that even though the activities under *purchasing level 3* are activities performed by leading management only, but are very unique and clearly separated from the activities performed under the *management* task. Apart from this discussion, the coded tasks and activities were confirmed as reasonable through the Forum members.

Purchasing competencies: As mentioned above, up to 25 competency attributes were identified per activity during quantitative questionnaire analysis. In order to keep the body of data manageable and reasonably short for use in the competency model, data limitation through prioritization of competency attributes was considered necessary by the Forum members.



Data prioritization was achieved by using red colored sticker dots (points) to mark those competencies considered most important. Prioritization was carried out per activity and each Forum member was asked to award up to 10 points according to the degree of importance they ascribe to the individual competency attributes. Through this procedure, each activity was limited to those competency attributes which were considered the most important ones. Additionally, where the Expert Forum agreed during discussions that important competency attributes were missing under certain activities, additional competencies were added to the individual catalogues.

c. Brainstorming on interview questions

The Expert Forum workshop's second part served to collect ideas for the second strand of data collection in the model development phase: the interviews with purchasing customers and management. A draft interview structure was set up by the researcher prior to the workshop and presented to the Forum members. Even though it was initially intended to collect participant reactions and ideas on a pin board through another brain writing session, it turned out that the Forum members preferred an open and unstructured

discussion here. It was therefore decided during the workshop to collect ideas and arguments through a moderated discussion on the questions: *“how should the interviews be structured?”* and *“what should be asked in order to get answers that are rich in content and thus valuable for analysis?”*. Discussion minutes were written down in bullet point form by the researcher and later used when setting up interview invitations as well as the researcher guideline which included the interview structure, topics and questions. The following agreements were made during the discussions:

- The interviews should be semi-structured and not open
- The interviews should start with questions about the general role and function of purchasing at DFS
- During the interviews, the logic to ask about purchasing tasks and activities before switching to competencies should be kept
- Questions should cover competency requirements now and in future
- There should be questions about the future situation of customer departments and how it might influence the above
- The interview should also collect some additional opinions on competency model development in general and model structure which could be valuable when it comes to designing the final model

The above discussion results were incorporated when setting up the interview questions (see Annex 6).

4.2.3 Answers to research question A

Based on the data collection and analysis as described above, research question A can be answered. As shown in Chapter 1, the answers to research questions A and B will be the foundation to set up the competency model.

Looking back at research question A and its sub questions, the following can be concluded:

What are the competency requirements of DFS purchasing professionals?

Sub-questions

- *What are the actual tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

The actual tasks, activities and competency requirements from purchasing professionals' view were analyzed from the quantitative data collected and summarized in Figures 43 – 49 below. For each task in DFS purchasing, a breakdown of main activities and competency needs was identified and drafted as a visual model. This draft model was built from data collected from the purchasing professionals' self-image.

However, as discussed earlier, the draft model might now need further development and input from the perspectives of purchasing customers and management. Consequently, research question B asks whether the self-image of purchasing professionals is reflected by the above stakeholder's expectations on purchasing professionals' competencies (foreign image). This will be explored through collecting and analyzing qualitative interview data (4.2.4).

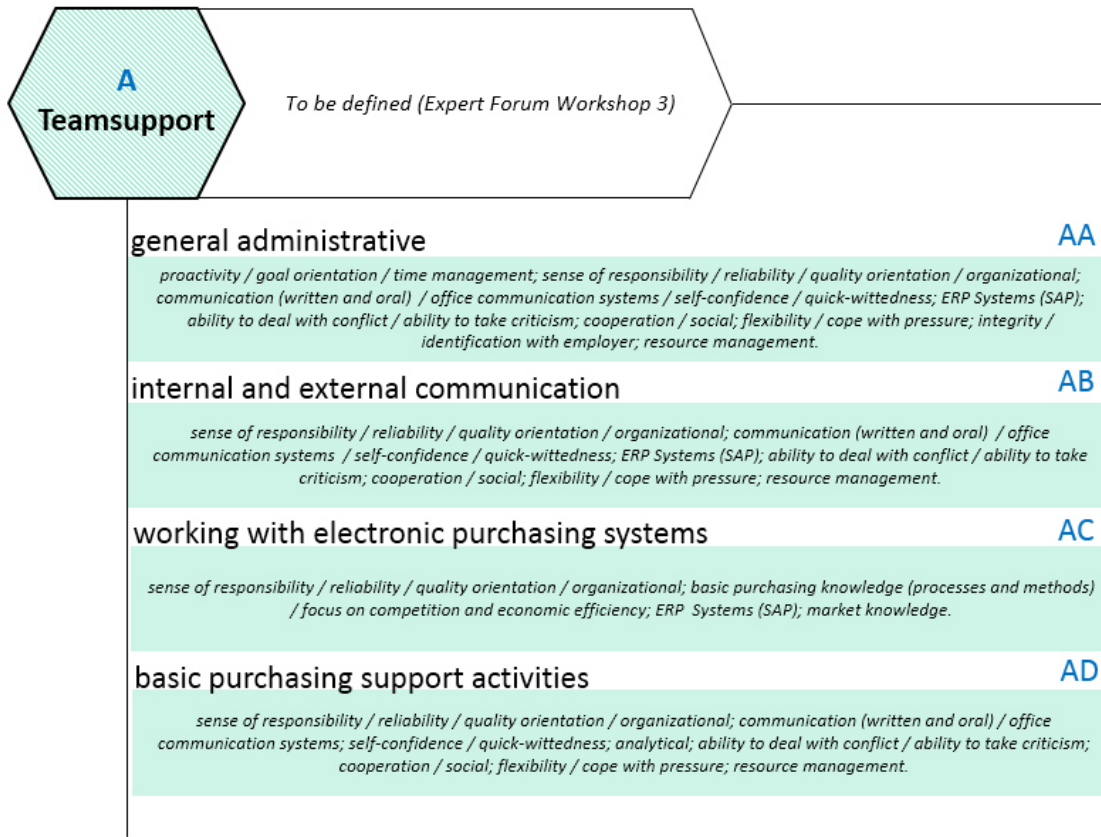


Figure 43 – Competency requirements *Teamsupport*

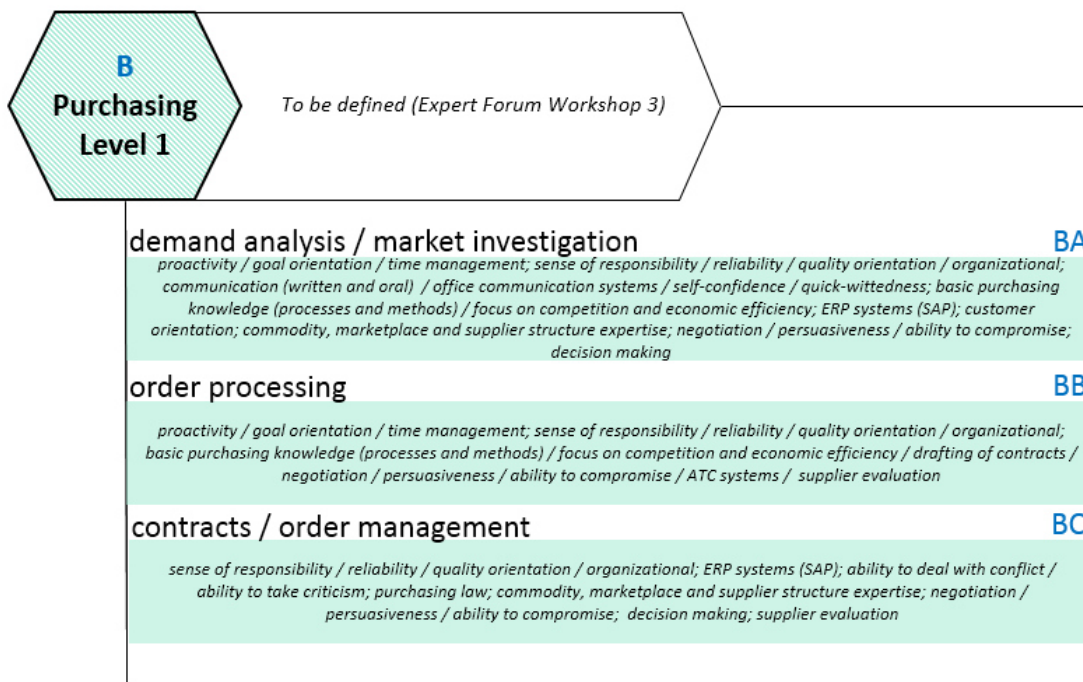


Figure 44 - Competency requirements *Purchasing Level 1*

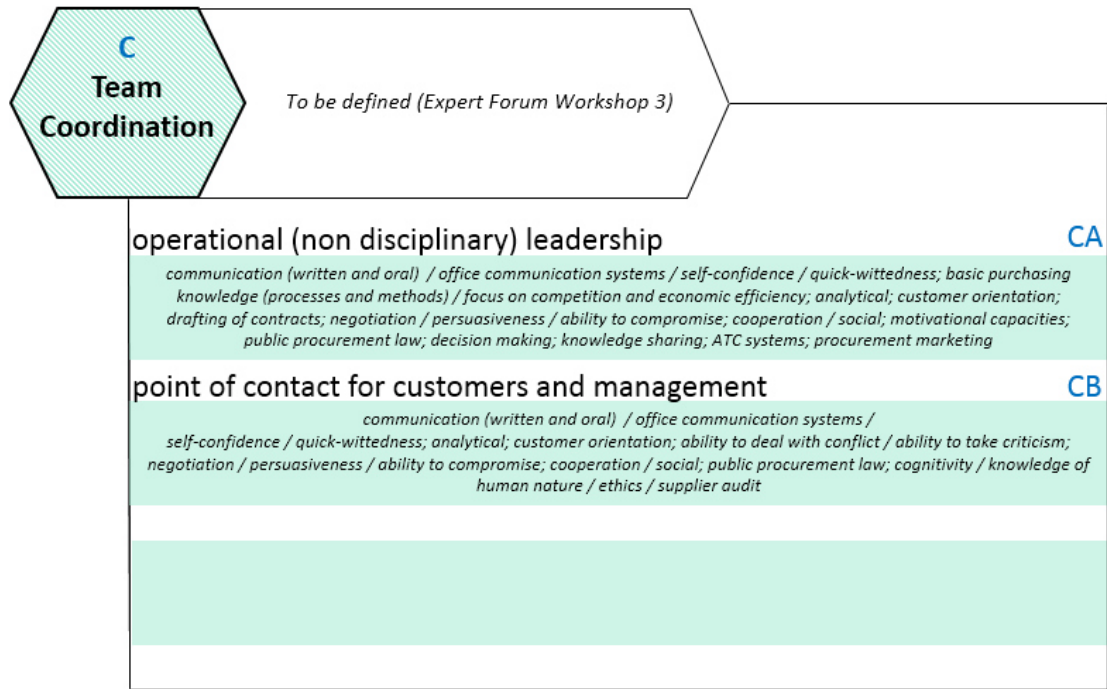


Figure 45- Competency requirements *Team Coordination*

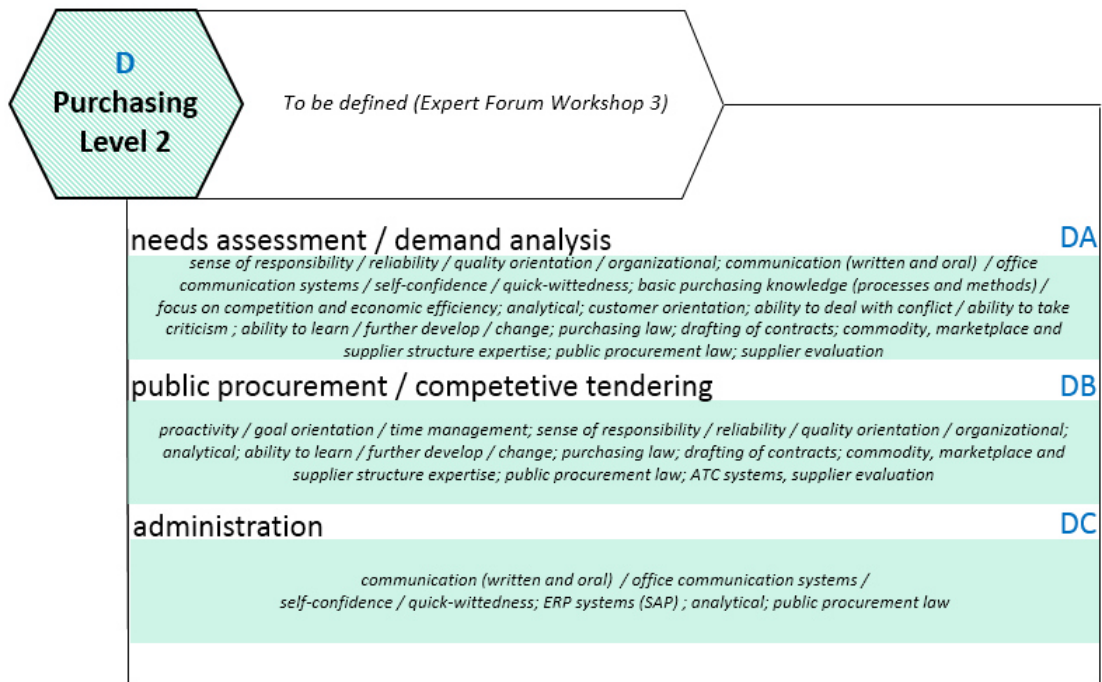


Figure 46 - Competency requirements *Purchasing Level 2*

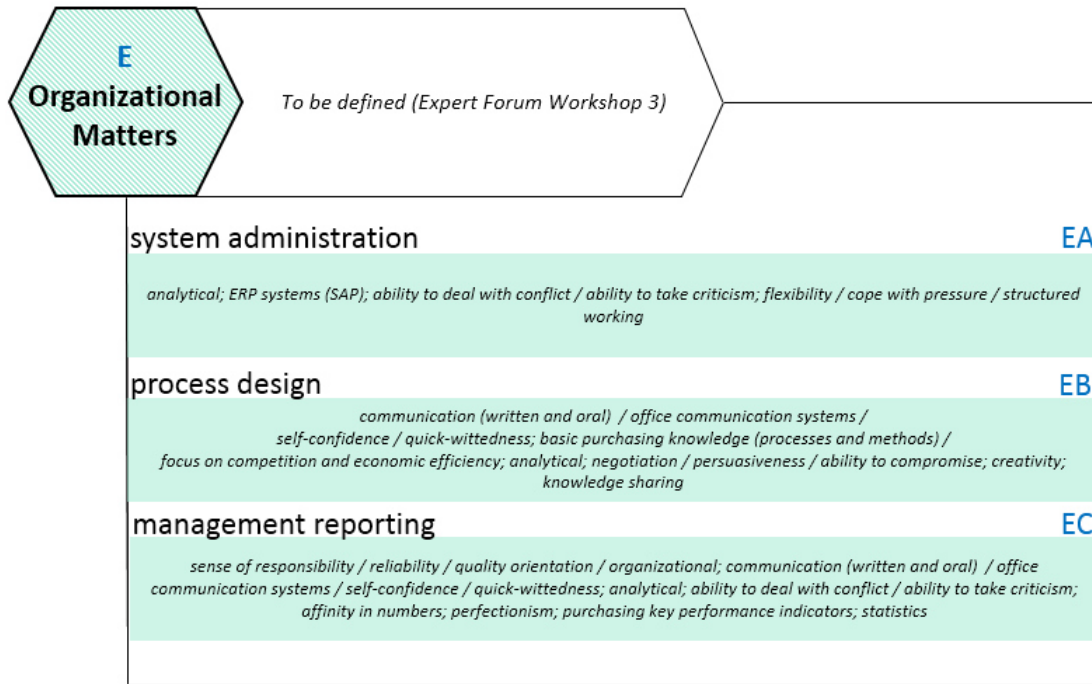


Figure 47 - Competency requirements *Organizational Matters*

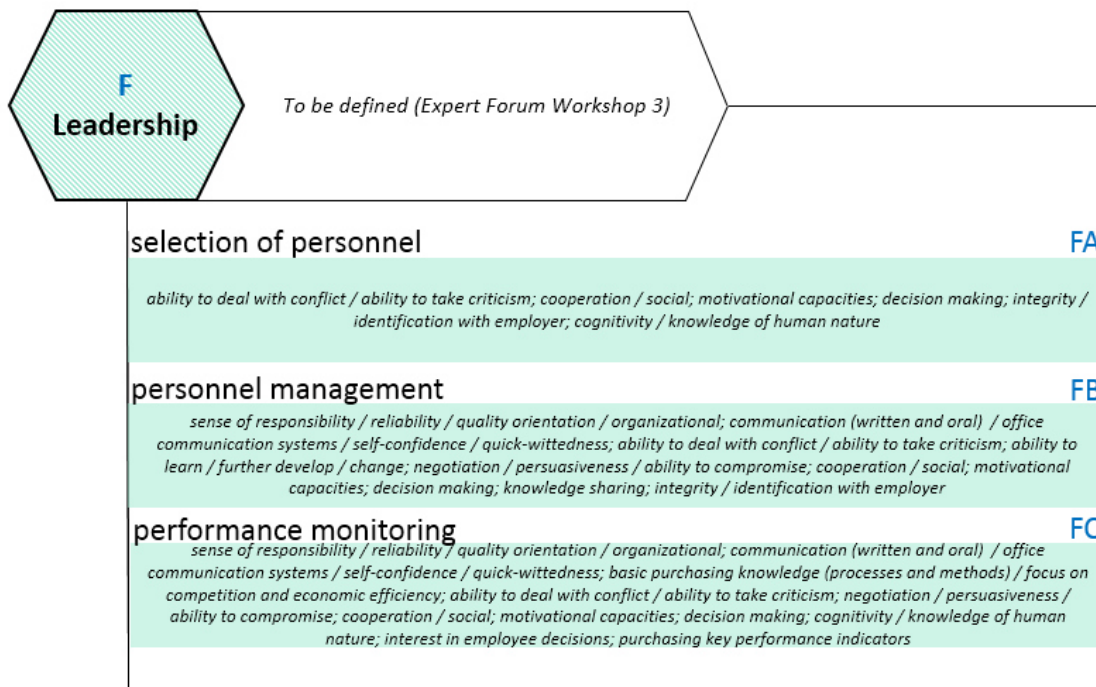


Figure 48 - Competency requirements *Leadership*

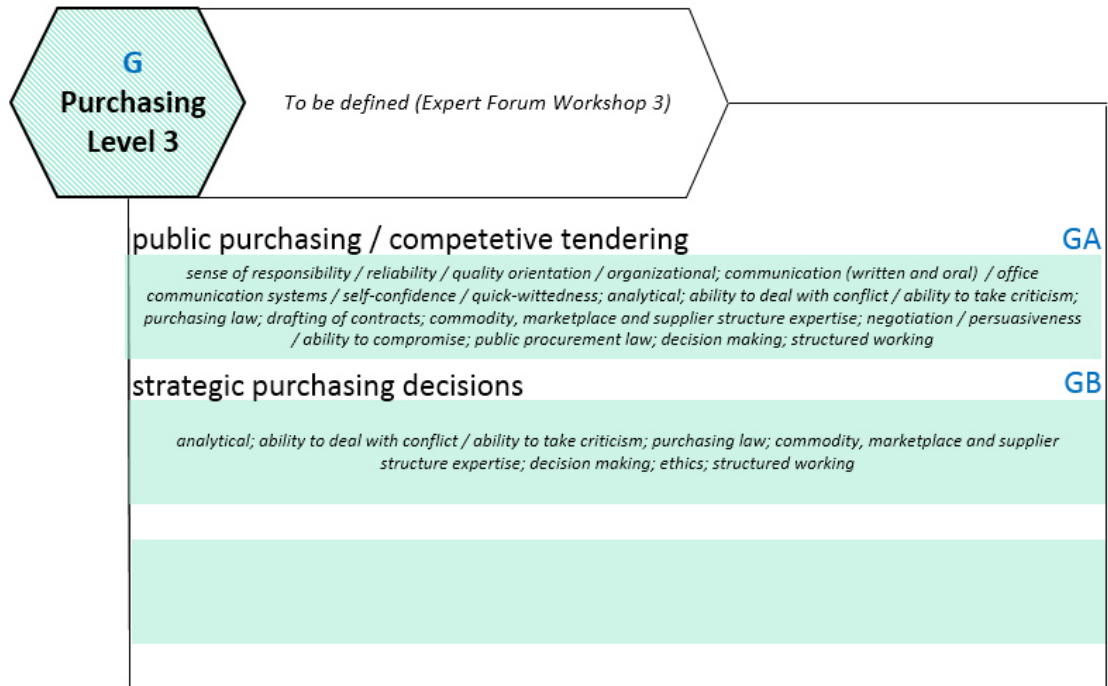


Figure 49 - Competency requirements *Purchasing Level 3*

4.2.4 Interviews

The following paragraphs focus on the conduction and analysis of interviews aiming to answer research question B. The interviews were analyzed through a process of data preparation, condensation and coding, as well as conclusion drawing. The introduction of interviews as a method and the reasons and approach of interviewing purchasing customers and management in this study are covered in Chapter 3.

Informed consent. As discussed earlier, an informed consent letter and declaration form (Annex 3) was prepared and distributed to all potential study participants. The form included a section where the researcher could tick boxes regarding the data collection methods envisaged for the individual participants. In this way, the same form could be used for questionnaire- and interview-participants as well as for Expert Forum members³. Figure 50 shows an excerpt of the form from a participant who did an interview only. However, in case it would become necessary to expand the informed consent (for example when the above interviewee would also become a member of the Expert Forum), this could be achieved by ticking the respective box on the form before participant information and signature.

Ich würde mich daher sehr freuen, wenn Sie meine Studie durch die Teilnahme an folgenden Methoden der Datenerhebung unterstützen würden:

(die für Sie zutreffende Auswahl ist durch ein Kreuz zu erkennen)

Datenerhebung durch einen Fragebogen	<input type="checkbox"/>
Datenerhebung durch Führung eines Interviews	<input checked="" type="checkbox"/>
Datenerhebung durch Teilnahme an Experten-Workshops	<input type="checkbox"/>

Figure 50 - Excerpt from informed consent form

³ Informed consent for observations was collected separately, see paragraph 4.4.

Generating meaning from interview data. In social research, the coding of qualitative data is of essential importance in order to make sense of collected information. Basically, data coding refers to the process of systematical interaction with the information collected and reflecting about its contribution to answer the research questions. More precisely, coding can be described as “*to condense extensive data sets into smaller analyzable units through the creation of categories and concepts derived from the data*” (Lockyer, 2004, p. 137). As it is my goal to interpret the interview data and to draw conclusions on DFS purchasing professionals’ competency needs based on this interpretation, data coding was considered essential for the study in hand. Bringing down the interview transcripts to more manageable units of text was achieved through text preparation and condensation. Then, coding continued through identifying themes and recurring patterns of information by using tables. As Lockyer (2004, p. 137) confirms, these steps in data coding are helpful to reveal “*links between different parts of the data that are regarded as having common properties*”.

As indicated in Chapter 3, my inductively driven overall approach to qualitative data analysis aims at generating codes, categories and theory through examining the collected qualitative data. Bourque (2004) confirms that for interviews and observations amongst other methods, codes are developed *inductively* after data collection and during data analysis. When describing my coding further down, I will come back to this issue.

In order to be of good value for the researcher, developed codes need to be *valid*. Validity can be achieved when the codes accurately reflect the research context and topic. Moreover, the U.S. General Accounting Office (1996) as

cited by Stemler (2001), adds that developed codes also have to *be mutually exclusive* and *exhaustive*. The requirement of exclusivity is met where the researcher succeeds in developing distinctive codes without overlaps and where no piece of information falls between two codes or is represented by more than one code. Coding can be seen as exhaustive when all relevant information is covered by code or, in other words, when the code represents all relevant information given in the interviews (Stemler, 2001). These standards were kept in mind and constantly reflected during data coding.

4.2.4.1 Data preparation

As described earlier, the interview sessions were audio-recorded and later transcribed. In order to better familiarize with the transcriptions and to check the transcription quality, the audio recordings were re-listened while reading the transcripts simultaneously. In this way, small mistakes or gaps in transcription (mostly with abbreviations, names or technical terms) were corrected and first notes and markings were made in the transcription documents. Also, the self-memos which were made during and shortly after the individual interview sessions were read again and, where possible, assigned to the parts of transcript they belonged to.

Through this initial step of analyzing the interview data, it became apparent that a tool would be needed to support displaying and analyzing the interview transcriptions. The main reason for this is that much of the useful information on purchasing competency needs seemed to be rather cryptic and hidden in the interview text. Some parts appeared to be of low value, others contained interesting, but fragmented information and needed to be structured and

condensed in order to reveal useful content. Besides, some interviewees did not respond to the posed questions in an order as expected, but mixed elements of different questions and sometimes answered questions not when they were asked, but later or earlier during the interview session. I will explain further down how the useful information was organized and displayed, which tool was used and how it was ensured that no important information gets lost.

In order to systematically process and exploit the comprehensive interview transcriptions, my approach for analyzing was inspired by Miles and Huberman (1994), who describe the three major streams of data analysis as a) *data condensation (formerly: reduction)*, b) *data display*, and c) *conclusion drawing and verification*. Saunders et al. (2009, p. 502) present this approach of data display and analysis as one of several “*inductively based analytical procedures to analyze qualitative data*”.

4.2.4.2 Data condensation and coding

Data condensation is used as collective term for the process of reducing, organizing, summarizing, focusing, discarding and coding of information and was introduced by Miles and Huberman (1994). Sometimes also referred to as data reduction, the above authors recently avoid this term as it might imply a decrease in data quality. However, data condensation is regarded as an integral part of the analysis process and starts as early as the researcher makes initial decisions like the overall approach of data collection or the selection of interview questions (Miles & Huberman, 1994; Miles, Huberman, & Saldaña, 2014).

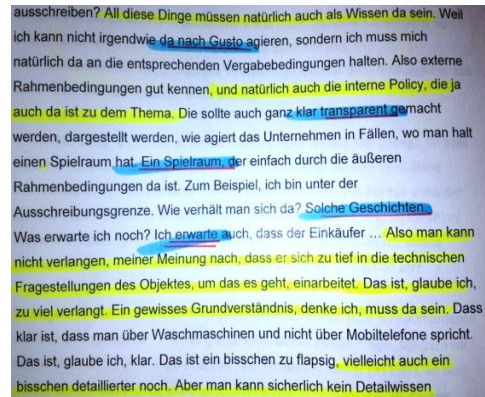
I consider data condensation vital for the overall study outcomes. As it is my goal to develop a useful and practicable competency model, its contents need to be tangible and specific, but not vague and hidden in encoded text. Consequently, a way to make best use of the available information needed to be found. The challenge here was to keep the balance between putting the interviewees speech into concrete terms or statements and staying as objective as possible when working with the text. In the next paragraphs, the process of condensation and analyzing the qualitative interview data will be described.

Eliminating data. Through carefully reading the transcriptions, those sentences or parts which were considered to contain no useful information at all were identified in a first step. These might include greetings, small talk and introductions, unexpected disruptions of an interview session or words of thanks which were transcribed from the audio recordings. These sections were cut and excluded from further analysis.

Arranging and first level data coding. Following the decisions to apply an inductive approach and to use inductively based procedures for qualitative data analysis, the interview coding was not based on predefined codes or fundamental results from previous research phases, which would indicate a more deductive approach in data coding. As stated earlier, I strongly expected some useful data to emerge from the interview transcripts in order to further expand the findings on purchasing competencies, but I stayed open and tried to free my mind from any ideas of possible codes beforehand. The coding of competency information was done without a framework (already explored competency needs) or theory regarding forthcoming findings in mind. No

codes were predefined when starting the coding process, but the codes slowly emerged from working with the raw data.

In this step of data coding, the interview transcripts were read very carefully line by line and initial markings on relevant words, sentences or whole sections were made. During this step, it was tried to initially identify expressions, phrases or statements that might include relevant information to answer research question B.



Examples of relevant chunks of information might be such information that could be found in several parts of one interview or equally in different interviews, or information which was stated as explicitly important by an interviewee, or information that refers to similar information already explored through the literature review or information which was familiar or even surprising to the researcher. All words, sentences, or parts of text identified as potentially valuable were marked and assigned with an individual code. At this level, codes could be single words, sentences or whole passages of text. Miles and Huberman (1994, p. 56) confirm that *codes are “usually attached to chunks of varying size – words, phrases, sentences or whole paragraphs.”* The picture above shows an example how the initial coding was done by marking relevant parts of the transcripts. By reading through all interviews, a huge number of keywords were used to code text parts that appeared worthwhile. The challenge here was to stay sensitive and open in order to identify any new or interesting aspect.

Data display to support first level coding. As mentioned earlier, the need for a tool to organize and further analyze interview contents became apparent. In order to enable further working with the qualitative data, Miles and Huberman (1994) suggest displaying the data in a graphical format like a chart or table and describe this step as “*an organized, compressed, assembly of information that permits conclusion drawing and action*” (Miles & Huberman, 1994, p. 11). Data display as tool for qualitative analysis supports further arrangement of data chunks and reflection on the contents through the researcher. It is described as preliminary stage for coding patterns and drawing conclusions as the identification of higher order themes beyond those initially discovered during the first steps of data condensation becomes possible (Miles & Huberman, 1994).

By bearing the above in mind, an Excel table was drafted as supporting tool for data summary, organization and coding. This early table was built as simple matrix which was set up closely to the original interview structure. The matrix featured one horizontal row for each interview session and different columns for the different questions asked. Also, the codes as already identified were added to the matrix and the corresponding text parts were marked in different colors.

By repeatedly reading the transcripts, the matrix fields were filled with excerpts or summaries of the transcriptions under the specific column headers. Initially, whole interview questions or keywords from them were chosen as column headers, which helped to not lose any potentially important bit of information. The handwritten interview notes and markings as made during data preparation were now helpful to better identify parts of useful information in the

transcripts and to keep the main sense of summarized statements. Besides coding, this step in data condensation aimed at becoming more familiar with the interview contents and served to neatly arranging all relevant information for the next steps. It also served to bring the extended interview transcripts to a more enriched form. According to Saunders et al. (2009, p. 491 + 492) summarizing helps the researcher in becoming “*conversant with the principal themes that have emerged*” and “*to identify apparent relationship between themes*”. Figure 51 shows how the initial Excel table was set up for coding.

	Question 1	Question 2	Question ...
1st level codes identified:	code 1, code 2, code 3, ...	code 1, code 2, code 3, ...	
Interview 1	text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ...	text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ...	
Interview 2	text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ...	text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ... text ...	
Interview ...			

Figure 51 - Interview analysis matrix (first level coding)

As result of the described approach, many different codes were developed that were still overlapping or inaccurate or sketchy and thus not yet fulfilled the earlier defined quality standards on setting up codes. However, by each iteration of reading and reflecting on the interview transcripts and developed codes, the matrix was gradually further developed and prepared for the following steps of data analysis. Through this process of initial coding, 62 first level codes were identified from the transcripts.

Sorting and building categories of codes. Through first level data coding and displaying as outlined, a large number of codes was identified. In order to prepare these interim results for further analysis and to reach the goal of

generating meaning from the data, the next coding step involved the building of code categories. Building categories refers to sorting codes and assigning them to groups with equal, related or even contrary contents. Through various iterations of thoroughly reading the matrix, previously developed first level codes were partly revised, replaced, pooled or scrapped or sub codes were added where necessary. Through this process, the structure of the matrix was extended and adjusted to reflect the progression in generating results. Additional columns were added, for example where new kinds of information were identified in certain chunks of raw data. The original matrix structure was gradually changed from sole display of interview raw data into a foundation and tool for a deeper analysis. Initial column headers were step by step replaced by thematic or higher level codes. The sorting and shifting of codes helped to identify similarities, relationships and contradictions between themes and interviewee statements. The codes were then finally assigned to three broad categories.

From the 62 first level codes as initially identified, 3 categories of codes were developed.

- Purchasing department self-image vs. public-image
- Experiences with purchasing department
- Process, interfaces and cooperation

The identified categories were then quality checked for exclusivity and exhaustiveness as described above. In this phase of data coding, it was tried to develop more abstract and general codes (categories) from the more concrete first level codes. The generalizations explored then served as basis for the development of theory which, in my case, would support the

development of a competency model for DFS purchasing professionals. Figure 52 visualizes how first level codes were clustered to code categories.

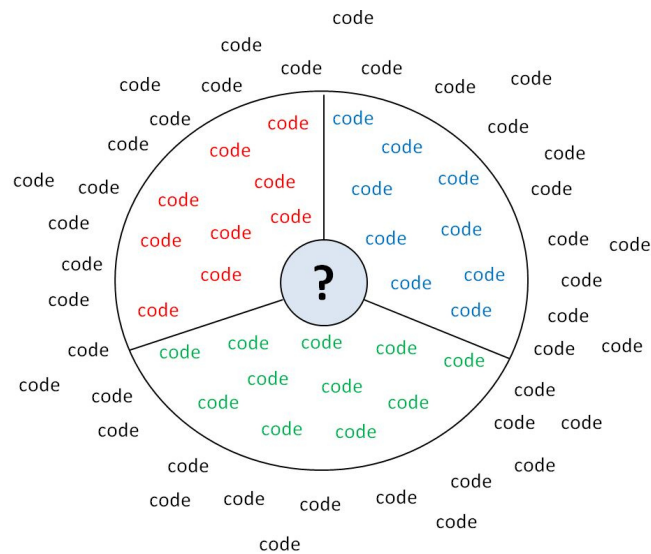


Figure 52 - Developing categories of codes

4.2.4.3 Conclusion drawing

The third step of data analysis is described as generating meaning from the coded qualitative data and demonstrating plausibility of researcher arguments. From the various “*analytic tactics*” as presented by Miles et al. (2014, p. 275), two were considered especially useful for the case study in hand.

Identifying patterns and themes from categorized codes

Basically, a thematic analysis of qualitative data focusses on identifying recurring themes or patterns of information and working out the ideas and meaning behind them. Based on the developed matrix, first level coding and categorizing, the next step was therefore to thoroughly examine the text chunks under the categorized codes and to identify interesting patterns of information, common themes or sequences and recurring information that might be meaningful and worthy for further investigation. Basically, this step of

data analysis involved further condensation of the categorized first level codes into more substantial and general statements. This was achieved by carefully shifting through the text chunks assigned to above categories and through identifying similarities, relationships and differences between individual contents. The goal of identifying patterns and themes was to progressively working out a set of general facts that cover the matching statements of the interview transcripts (Miles & Huberman, 1994).

Making contrasts and comparisons

Also, conclusions could be drawn from comparing and contrasting different interviewee statements. Miles et al. (2014, p. 284) confirm that various aspects can be contrasted: "*persons, roles, activities, variables, cases as whole*". Regarding the interview data in this case study, it might be interesting to compare how people with different organizational backgrounds and roles express their views regarding purchasing competency related topics and questions. Especially when looking at the first two categories of codes as identified above, *purchasing department self-image vs. public-image* and *experience with purchasing department (events, occurrences, conflicts, and success stories)*, differing opinions and significantly divergent statements might add to draw meaningful conclusions.

Summarized, the following questions were kept in mind during data analysis: *What are the fundamental messages and what common themes emerge from them?; What patterns can be identified and how can they help to answer the research question?; Are there contrary statements or deviations from the identified patterns and how can they be explained?; Is there any indication that additional data should be collected or research questions should be revised?*

Again, various iterations were necessary to reach the objectives of this step in data analysis. The next paragraphs present a thematic analysis and identification of implications for DFS purchasing professionals' competency needs of the prepared data. This includes identifying recurring themes within the three above defined categories, comparing equal and diverse statements of interviewees and the identification of competency information from them.

Category: Purchasing department self-image vs. public-image

From various transcript passages dealing with the discrepancy of purchasing's self-image with the customer's view of the purchasing function, a discussion on the various roles of purchasing and its professionals could be identified.

Even though some hints were found that purchasing is still considered as subordinate support function, sole service provider upon customer request or clerical paper pushing function, the majority of statements expressed an appreciation of the purchasing function and described it as equal and competent partner for taking purchasing decisions. Three recurring themes could be identified from the interviewee's statements on purchasing professionals' roles, each of them indicating diverse competency requirements of purchasing professionals. Purchasing was described in various roles:

- A. Purchasing as initiator of value-adding activities*
- B. Purchasing as provider of know-how and expert knowledge*
- C. Purchasing as subordinate, paper pushing function*

Statements A and B on the role of purchasing within DFS company match the findings from the short evaluation of the purchasing function at DFS as presented in Excursion 2 of Chapter 2. However, in order to remain objective

and open to all sorts of interviewee expectations, all three above themes were considered as valuable and analyzed for references to competency requirements. From the customer's above views of the purchasing function and purchasing professionals' roles, the following competency needs can be concluded.

Theme A: Purchasing department as initiator of value-adding activities

Customers and management expect purchasing professionals to add value to the overall process of acquiring goods or services. In times of decreasing budgets, cost targets and projects being closer monitored by general management, *cost control* was mentioned as essential value adding activity of purchasing professionals.

Even more than the traditional identification and evaluation of price and cost levers, the optimization of the total cost of ownership is an effective and much desired tool for boosting competitive advantage. As a large percentage of the total cost of a product or service is determined by decisions made before the traditional procurement process begins, early involvement and close teamwork with product development is one primary aspect to be implemented in purchasing processes. The need for competencies in process development and team work are described further down (Theme G).

Cost control was also mentioned to include the activity of designing cost-effective supply contracts and leading cost-down negotiations. Legal competencies and skills regarding contract negotiation and design are covered in Theme F. However, the following competencies in the discipline of

economics were identified as important to perform the more basic and practical activities of cost controlling:

- financial controlling and accounting
- investment
- cost accounting / analysis (TCO)
- pricing

Additionally, the activities of providing marketplace and supplier information as well as supplier identification (sourcing) are considered to add value to the purchasing process. As link between customers and suppliers, purchasing professionals are also expected to actively inform potential suppliers about customer needs and to support development of existing suppliers to meet customer's future requirements. The following purchasing professionals' attributes support these activities and provide the basis for understanding customer needs:

- commodity, marketplace and supplier structure expertise
- networking / relationship building
- ability and willingness to share knowledge

All above activities are generally confirmed to add value to the purchasing process (Leenders & Schiele, 1999). The authors add that *facilitation of the purchasing process* also belongs to any value adding activities of purchasing department. This finding is in line with the statement above that adjusting processes are an important activity of the purchasing process owner (see Theme G).

The aspect of commodity expertise is frequently discussed as field of purchasing competencies and will be examined in more detail in Theme E. Building and maintaining supplier relationships as well as ensuring legal

certainty were identified as other value adding activities and will be presented further down.

Theme B: *Purchasing department as provider of know-how and expert knowledge*

One frequently identified interview theme was the role of purchasing in providing know-how and sharing knowledge. Purchasing professionals are seen in the role to put customers in the position to better understand and get a feel for purchasing related topics such as competition law, supply management, commercial priorities, contracts or legal pitfalls. Even though all DFS regulations and procedures are documented and available through the company's intranet, customers expect purchasing professionals to inform about internal purchasing- and related processes, regulations or law changes and to provide support in questions of compliance. It was also mentioned that purchasing could be well imagined as provider of information about product innovations, market development, new suppliers and sources, product alternatives / substitutes, etc. The conduction of workshops and training sessions, the presentation of relevant news, organizing round tables for sharing knowledge and moderating meetings with potential or existing suppliers or consultants were mentioned as desired activities of purchasing. Also, the writing of operational instructions, handbooks, policies and guidelines are possible activities of a knowledge sharing and know-how providing purchasing department. The competency needs identified to fulfill this role are:

- knowledge sharing (willingness and ability)
- teaching (explaining, training, presentation)
- patience and didactics

- communication (discussion, argumentation, presentation, writing style)
- legal / compliance / contract design
- commodity, marketplace and supplier structure expertise

Theme C: subordinate, paper pushing function

As mentioned earlier, some indications were discovered in the interviews that purchasing is not primarily seen as a value adding, strategic corporate function, but rather as a subordinate and supportive function. As this view is opposed to DFS purchasing department's self-image and contrary to the results of the analysis of its status within DFS company (Excursion 2), purchasing professionals should be prepared to argue against such opinions and to actively explain and sell the ability to add value to the customers. Convincing customers of the possibilities of purchasing to add value and support customer in achieving their own goals is extremely important. Customers who are not convinced of benefitting through involving purchasing department are very likely to contact suppliers and purchase goods and services on their own and without involving purchasing department (maverick buying), even if this would be a breach of DFS internal regulations and prevent purchasing to succeed in keeping project costs low. To achieve the above goals, purchasing professionals should have the following competencies:

- ability to make clear and sell purchasing's value add and strategy
- communication (discussion, argumentation, presentation, writing style)
- persistence and assertiveness
- conflict resolution and reach consensus
- specialized and deeper knowledge in purchasing and supply management
- willingness and ability to solve problems

Category: Experiences with purchasing department

When analyzing the interview transcripts, it became apparent that some interviewees had difficulties to accurately answering the posed questions or distinguishing between closely related questions. Especially purchasing department customers sometimes preferred intricately expressing things through reporting their own *experiences* with purchasing department. Consequently, some interviews contained personal stories and shared memories of events, occurrences and conflicts or success stories. From their individual experience, interviewees reported which actions, omissions, conflicts or cooperation led to success or failures. Criticism was explicitly expressed and involved people were even named directly. From these narrative interview parts, meaning in terms of recurring themes could be identified which are helpful to deduce additional competency requirements of DFS purchasing professionals. Positive as well as negative experiences were reported by the interviewees. Both were considered important to identify themes from which competency requirements might flow. Three recurring themes were identified from the customer's reports on experience with purchasing department:

- D. conflicts with purchasing professionals*
- E. commodity expertise and background of professionals*
- F. legal activities of purchasing professionals*

Theme D: *Conflicts with purchasing professionals*

As addressed above, interviewees often reported of situations of disagreement or discord with purchasing professionals to express their experiences and

expectations. Due to its interface function within DFS, purchasing is expected to balance the diverse goals of various departments such as finance, legal, audit, human resources or top management when making purchasing decisions and when pursuing its own strategy and objectives. Purchasing department as process owner with final responsibility for all purchasing decisions is confronted with different areas of conflict resulting from its own role and self-image. This situation often results in conflicts of interest which should be addressed by purchasing professionals. The following areas of conflict could be identified from the interviewee's narrative:

- *purchasing as service provider vs. purchasing's own strategy and goals*
- *purchasing decides based on possible savings and ignores other criteria*
- *purchasing presses for competition even if it seems fruitless*
- *purchasing designs contracts without knowing the real world*
- *purchasing wants to be involved early, but has little to offer and adds low value*

Conflict resolution skills might be a good basis for purchasing professionals facing above conflicts, but more precise competency requirements need to be defined for use in a competency model. From the above areas of conflict, the following competency needs can be concluded:

- ability to balance customer needs and expectations with purchasing strategy and goals
- conflict resolution and reach consensus
- ability to make clear and sell purchasing's value add and strategy
- ability to jointly discuss and define evaluation criteria in tender process
- cost / benefit analysis (tender assessment)
- willingness and ability to solve problems
- legal / compliance / contract design

Theme E: *commodity expertise and background of professionals*

One major and ever recurring theme is the question of the degree of specialized commodity knowledge and technical expertise purchasing professionals need in order to provide good service and added value to their customers. Most interviewees confirmed that purchasing professionals should have at least basic expertise of the customer's individual business environment and material groups frequently requested. However, in order to communicate at eye level with requesting customers, purchasing professionals need to develop specific competencies and deeper knowledge of certain commodities, its market rules and mechanisms. Expert knowledge on the supplier base for certain goods and services as well as profound understanding of market trends and developments are requested by DFS purchasing customers. Commodity expertise supports customer acceptance of the overall purchasing function as well as the trust and confidence in purchasing professionals' success when negotiating terms and conditions in the best customer interest. The interview analysis shows that early involvement of purchasing can be imagined as beneficial by the customers in case informed guidance and advices through purchasing professionals support customer decisions on product development regarding features, design and components. Wrong decisions regarding long term use of material and products might be prevented through involvement and contribution of purchasing professionals expertise on products and markets. The following competency requirements of DFS purchasing professionals support the above thoughts:

- deeper technical commodity expertise

- commodity, marketplace and supplier structure expertise
- market development and supplier base knowledge as well as factors of influence (economy, politics, law ...)
- ability and willingness to share knowledge

Theme F: legal activities of purchasing professionals

The vast majority of interviewees brought up purchasing's special role as authority for special and purchasing related legal matters within DFS. Customers do not want to develop own legal expertise, but want to benefit from legal competencies of purchasing professionals. In fact, purchasing is sometimes even seen as preferred partner for clarifying legal aspects rather than DFS legal department due to the adoption of more pragmatic views and approaches. This is somewhat unusual and grounded in the special balance of tasks and powers between purchasing and legal department at DFS. DFS purchasing, compared to other companies purchasing departments, is traditionally involved in more legal activities. For example, DFS as state owned company has the obligation to apply public purchasing law, pricing law and some special compliance rules and regulations. This fact underlines the special role of purchasing and purchasing professionals within DFS. The general need for legal competencies and drafting of contracts was already identified through the questionnaire analysis. However, interviewees went into more detail regarding expectations of activities and competency needs of purchasing professionals regarding legal abilities. Purchasing professionals are seen as responsible for the following activities:

- negotiation of contractual agreements
- drafting / design of contracts and related documents
- handling of impairment of performance / default / warranty cases, etc.
- public procurement

Negotiation of contractual agreements

A broad understanding and expertise of certain fields of law (purchasing law and related areas) as well as skills in negotiation is mandatory for successful contractual discussions.

Contract negotiations often include purchasing and customers acting as one team to reach predefined technical or economic goals or to discuss contractual terms and conditions. However, contractual formulations are often directly related and dependent from technical details of the products or services in focus. This means that in order to approaching the negotiating party as one single (DFS) body, it is necessary that purchasing professionals who are in charge of negotiating contractual details have an understanding of the products or services to be provided by the supplier. The necessity to have commodity expertise as described above (Theme F) is therefore also important for the activity of negotiating contractual agreements.

Drafting / design of contracts and related documents

Drafting of contracts and other contractual documents such as letters of intent, memoranda of understanding, standard terms and conditions, text modules for standard purchase orders, tender documents, non-disclosure agreements, usage rights, license agreements, etc. belongs to a purchasing professionals' most important activities. As indicated above, DFS purchasing department has sole responsibility for issuing high quality and legally certain purchasing documents which reflect the customer's needs as well as their rights and obligations in compliance with internal and external rules and regulations (audit-proof). Customer departments do not take responsibility for mistakes in

contractual documents and give their co-signature for contractual documents only for technical contents and accuracy.

Handling of impairment of performance / default / warranty cases, etc.

In cases of wrong delivery, poor supplier performance or other problems during the contractual period, purchasing professionals are expected to officially address the case and discuss possible solutions with suppliers. Even though this might end up with escalating cases to legal department, for example when issues have to be taken to court for dispute resolution, purchasing professionals are the customer's point of contact and in charge of the process.

Public procurement

In state-owned companies like DFS, public procurement law plays a central role. All purchasing activities exceeding certain threshold values have to be in line with the rules and regulations of one of the most complicated and fast-paced areas of German and European law: public procurement law.

The following competency requirements can be identified from the above legal activities:

- deeper technical commodity expertise (depending on customer department)
- procurement (private) law
- analytic
- negotiation
- design of contracts and other contractual documents
- public procurement law
- ability to learn / further develop
- ability and willingness to share knowledge

Category: purchasing process, interfaces and cooperation

Theme G: *Purchasing department as owner of the purchasing processes*

Most interviewees acknowledge that purchasing department is in charge of managing the purchasing process and related sub-processes like data protection, labour leasing or purchase requisition processes. In their role to manage the DFS purchasing processes, purchasing professionals are expected to take responsibility for various activities.

These activities include the identification of areas which need to be regulated through new processes, the design of necessary process steps, discussion, determination and communication of responsibilities, and the development of proper process documentation. Managing the purchasing processes also includes keeping track of necessary process changes (facilitation) and proactively keeping processes up to date. From the above requirements and purchasing activities, the following competency needs arise:

- understanding of DFS corporate structure and culture
- analytic
- knowledge on process-driven company structures
- process development and mapping
- legal / compliance / contract design
- communication (discussion, argumentation, presentation, writing style)
- project management

The above competencies are confirmed by Fischermanns (2013) as a process owner's competency requirements.

Theme H: *cross-functional tasks and attainment of mutual goals*

Purchasing customers and management have matching expectations regarding cross-functional cooperation of purchasing and customer departments. The general requirement to work as a team was specified more precisely through various statements and reporting of past experiences. Cooperation of departments was described as acting jointly and aiming to succeed in reaching shared as well as individual goals. Defining common goals and taking joint decisions were reported to lead to purposeful and effective actions. Hereby, it is expected that purchasing professionals should take the initiative and be motivated to proactively form teams and bring all stakeholders together. Acknowledge of individual goals and appreciation of opposing views and suggestions were underlined as critical success factors for cross-functional cooperation and the attainment of mutual goals. Proactively involving personnel resources and addressing problems and possible pitfalls in the purchasing process should be undertaken by purchasing department. Due to its central and cross-linked function with interfaces to various corporate divisions within DFS, many streams of information converge at purchasing department. According to customer statements, purchasing may either use this information and power to prevent and block customer plans or use and spread the information to promote and drive things forward in the interest of the customers (see Theme B). Purchasing professionals' competency needs for the above activities would be:

- proactive teambuilding and coordination
- ability to motivate and promote team cohesion
- definition of goals and goal orientation
- willingness and ability to solve problems
- conflict resolution and reaching consensus

Theme I – *Focus on purchasing of services*

One important trend as reported by purchasing customers is the lowered demand of hardware supplies with a simultaneous raise of the demand for external services. This shift in the customer requirements structure can be explained through various effects. Firstly, the trend to reduce internal effort for developing, hosting and maintaining IT systems was decided as long term strategy by DFS general management. Also, outsourcing of support functions and concentration on company core competencies is an ongoing general trend also at DFS. Thirdly, the refusal to approve replacing retired or leaving employees creates additional bottlenecks in work-intensive projects, which have to be compensated through external services or labour leasing. Additionally, the raising complexity of ATC environments, market fusions, changes of external customer demands and legal challenges demand for an extensive need for external consulting and support.

All the above raise the demand for external service providers, which have to be sourced and contracted through purchasing department. Also, the ever developing field of labour law and its jurisdiction in the fields of service contracts, contracts for work and labour, pseudo-self-employment (fictitious independence of service contractors) and labour leasing demands for advanced legal knowledge as well as competencies to also equip the requesting customers with information on pitfalls and legal risks in working with external resources.

In summary, buying services poses particular challenges as well as competency requirements on purchasing professionals. In order to cope with

these challenges and to provide customers with the resources needed, special competencies regarding the purchasing of services is needed for the purchasing professionals in charge.

- special legal knowledge for buying services (labour law and jurisdiction)
- labour leasing
- commodity, marketplace and supplier structure expertise
- ability and willingness to share knowledge
- conflict resolution and reach consensus

4.2.5 Interview analysis findings summary

Through conducting expert interviews, a large variety of information regarding customer and management views on DFS purchasing professionals' activities and competency needs was identified. Based on three broad groups of developed codes, a number of nine recurring themes were identified in the interview transcripts. Each of these themes represents individual expectations, views, experiences, requests and wishes regarding purchasing professionals' activities. These additional activities were analyzed and the specific competency requirements needed to perform them were concluded by the researcher. Thirty-six competency requirements of DFS purchasing professionals were identified through the analysis of the above narrative. Some of them are very detailed and specific to the individual DFS context. A matrix which summarizes the purchasing activities identified as well as the identified competency attribute can be found in Table 4 (p. 306) below. Some of the competency attributes as identified from the interviews were also claimed as important by purchasing professionals themselves and identified through the questionnaire analysis. However, these already known competency attributes were concretized and formulated in more detail and with a context background and thus helped to understand why they are important. Also, a couple of new and highly specified competency requirements were explored through the interview analysis.

4.2.6 Answers to research question B

Based on the data collection and analysis as described above, research question B can be answered. Looking back at research question B and its sub questions, the following can be concluded:

Does the purchasing professionals' self-image on competency requirements reflect customer and management expectations?

Sub-questions

- *What are customer and management expectations on tasks and activities of DFS purchasing professionals?*
- *What competencies are needed to perform them?*

From analyzing the expert interviews, it becomes apparent that the findings on purchasing competency requirements as analyzed from the questionnaire data were incomplete. The purchasing professionals' self-image on competency requirements only partly reflects customer and management expectations. It seems that even though all purchasing professionals were asked for the most important competency requirements necessary for their activities, purchasing customer expectations on competencies go far beyond purchasing professionals' self-perception. Purchasing customers and management identified many activities and specific competency needs of DFS purchasing professionals which were not mentioned or not regarded as important by purchasing professionals themselves. The customer and management view on purchasing activities and competency requirements were analyzed as described above. The results are summarized in Table 4.

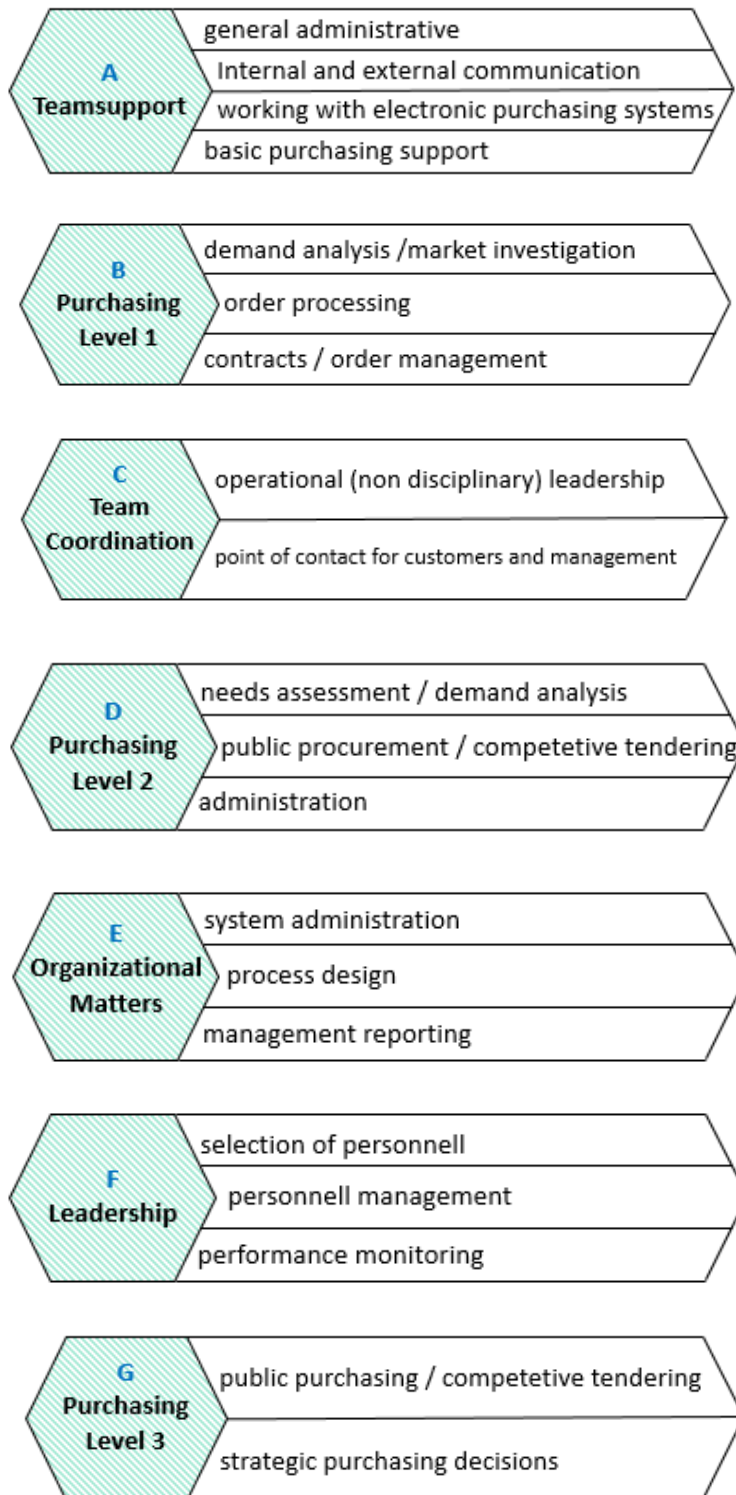
From the answers to research questions A and B, the competency model for DFS purchasing professionals can be designed.

4.3 DFS Purchasing Competency Model

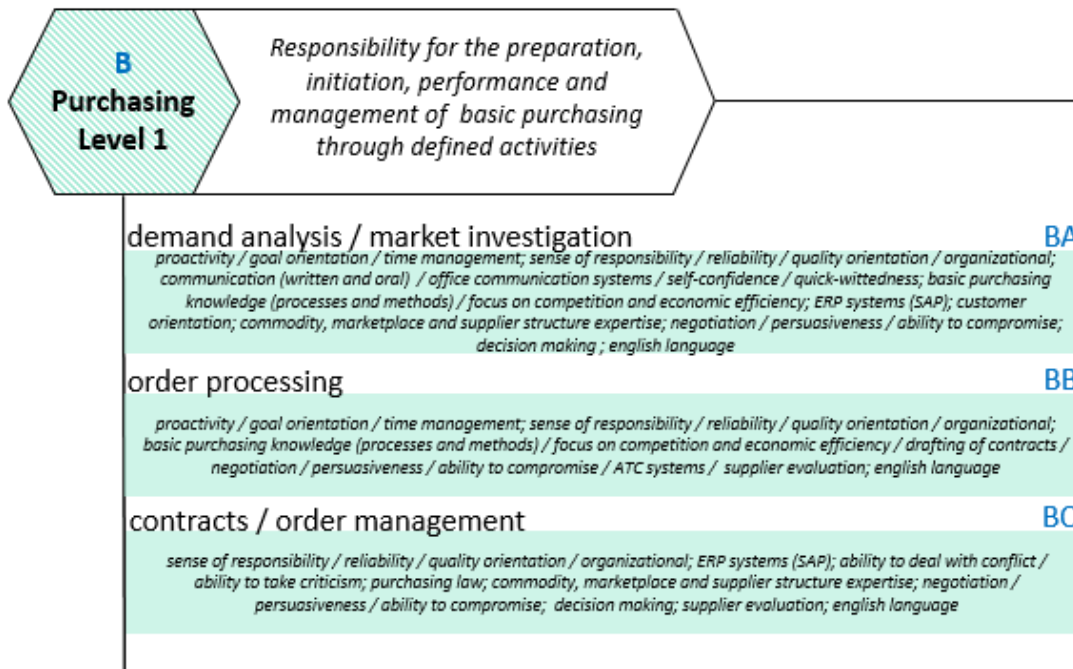
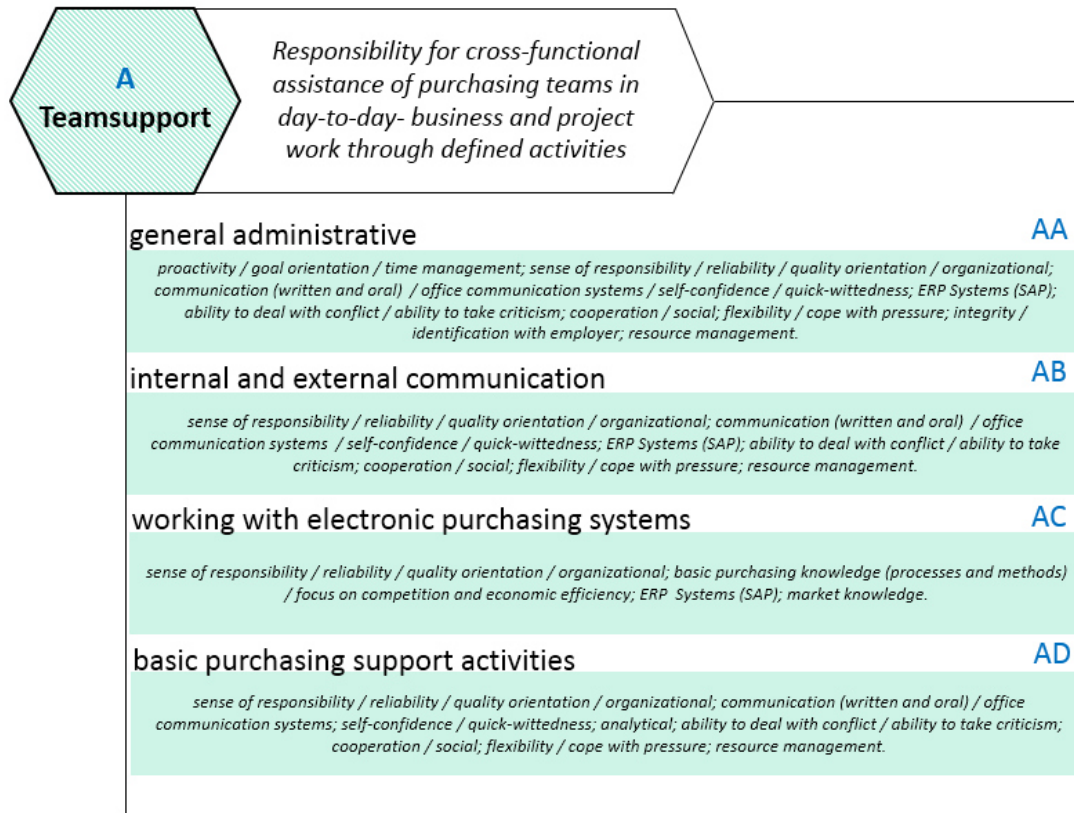
The figure below shows the seven main (superordinate) task areas at DFS purchasing department.



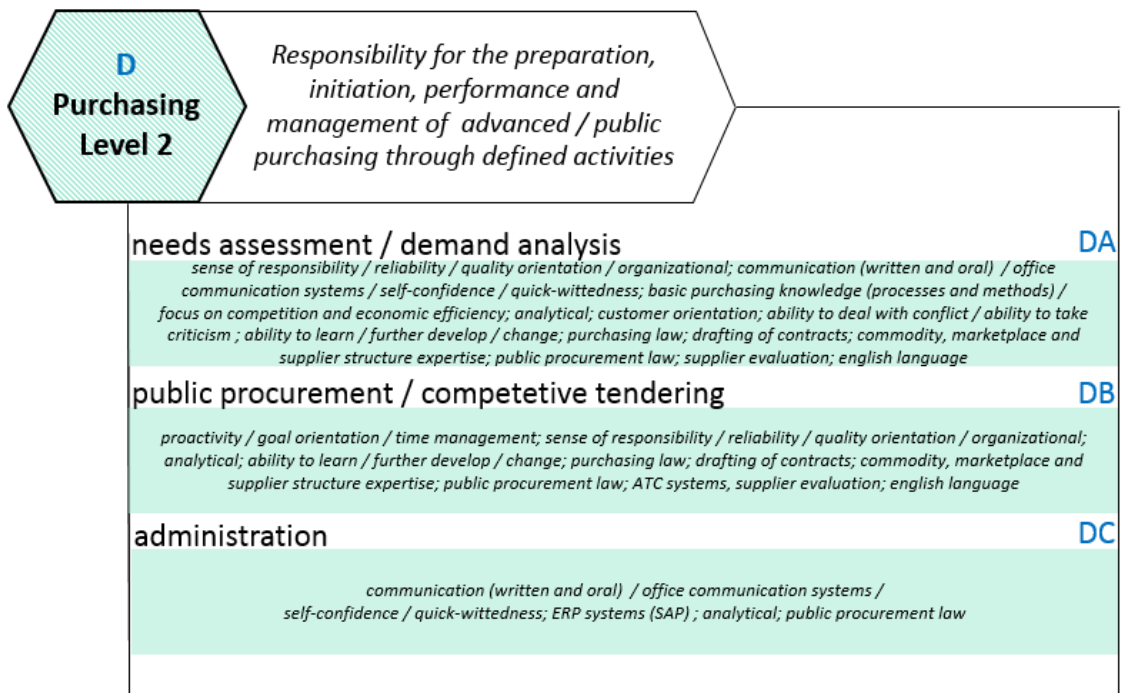
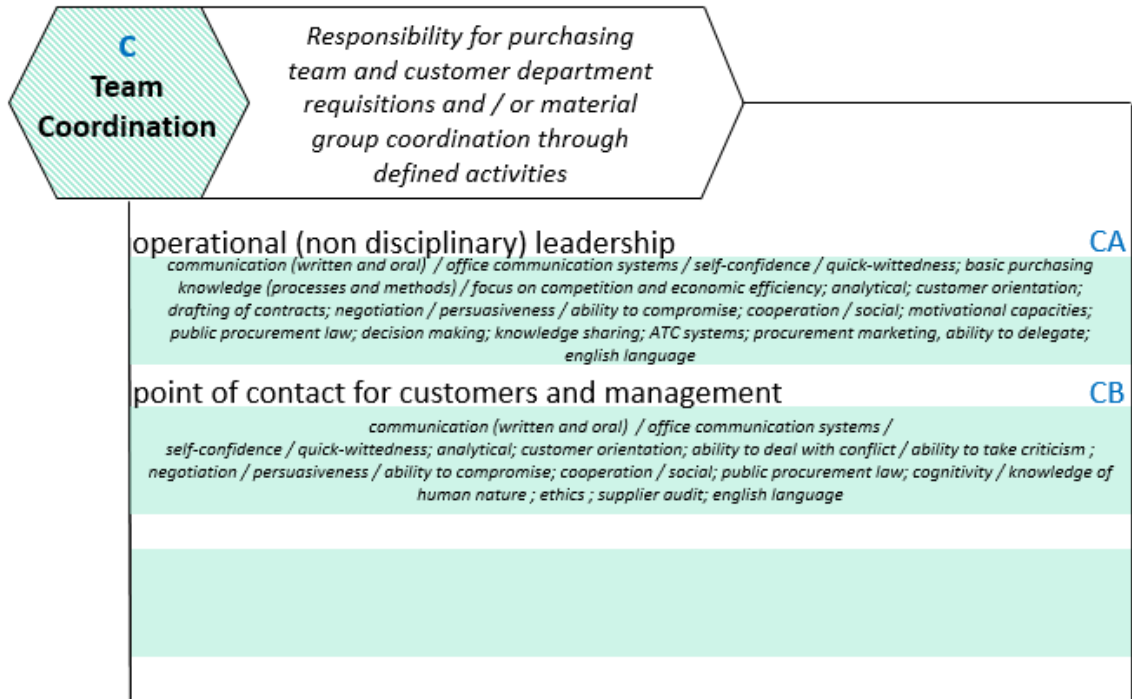
Based on this framework, various tasks can be assigned to each employee at DFS purchasing department to form a purchasing profile. For each of the assigned tasks, a number of purchasing activities is defined. The figures on the next pages show all above superordinate purchasing tasks and definitions with their corresponding main activities as well as the individually identified competency needs.

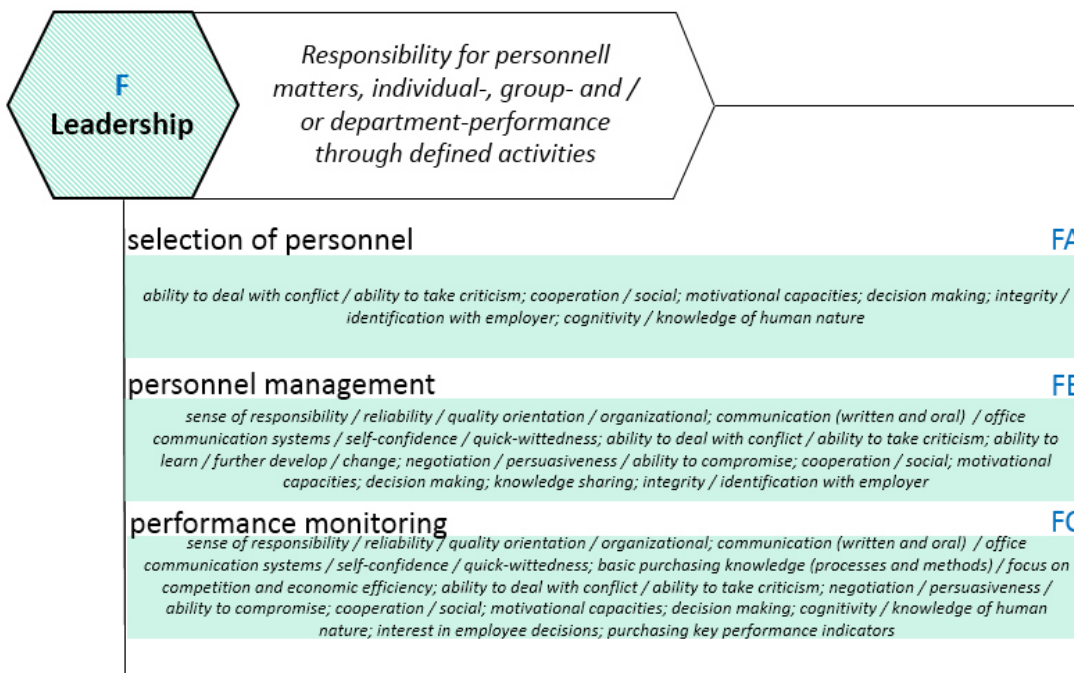
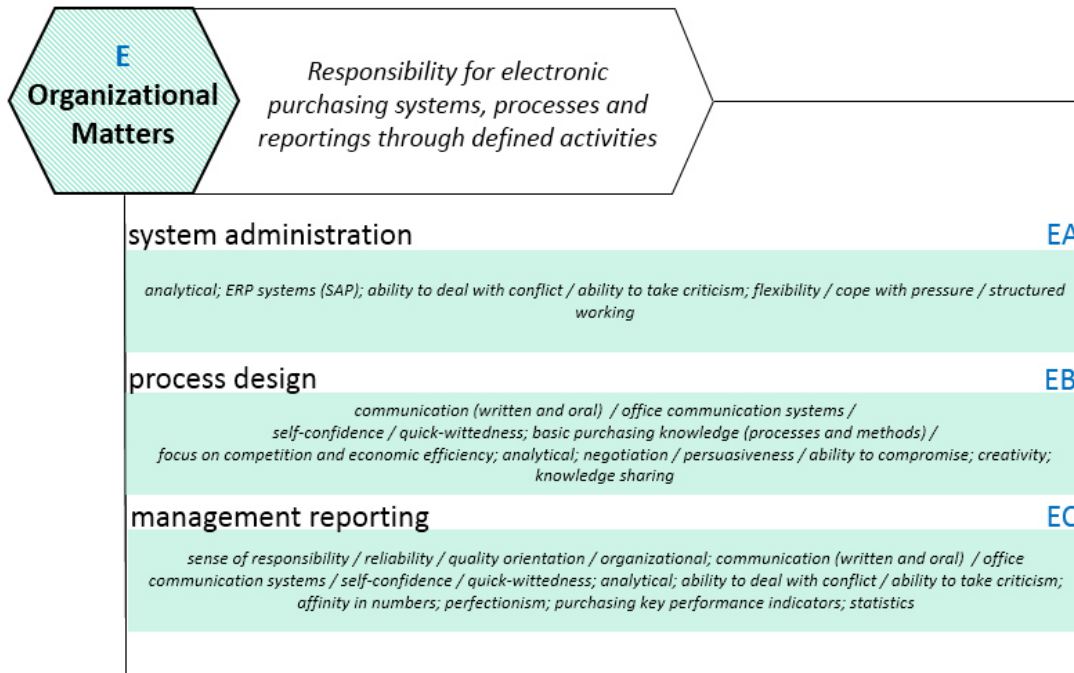


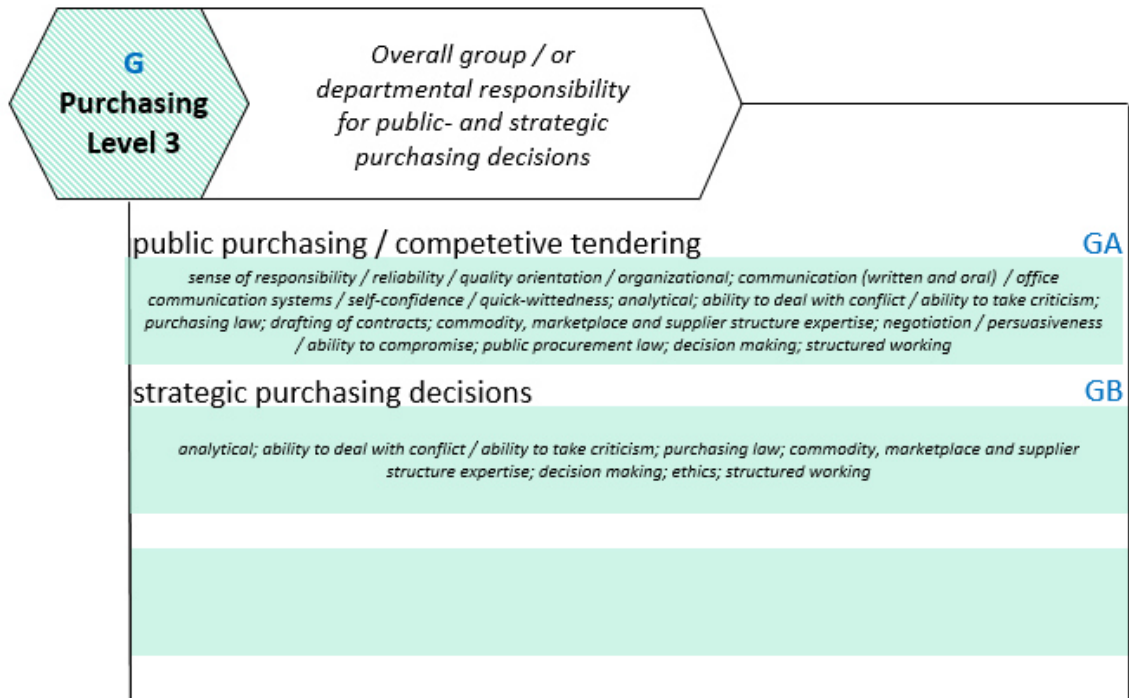
For each activity, a number of competency needs was identified⁴.



⁴ Definitions for purchasing tasks as shown here were developed in Expert Forum 3.







Additionally, a number of specific (advanced) purchasing activities and corresponding competency needs were identified which can be added to the purchasing competency profiles where necessary.

competencies	purchasing activities									
	controlling costs	providing marketplace- and supplier information and expert knowledge	communicating purchasing value add	solving conflicts	providing commodity expertise	legal activities	Process owner activities	learning and networking activities	buying services	
balance customer needs and expectations with purchasing strategy and goals				X						
conflict resolution and reach consensus			X	X				X	X	
jointly discuss / define evaluation criteria (tender process)				X						
learn and further develop						X				
make clear and "sell" purchasing's value add and strategy			X	X						
motivate and promote team cohesion								X		
analytic						X	X			
commodity, marketplace and supplier structure expertise	X	X			X					X
communication (discussion, argumentation, presentation, writing style)			X	X			X			
cost / benefit analysis (tender assessment)				X						
cost accounting / analysis (TCO)	X									
definition of goals and goal orientation								X		
design of contracts and other contractual documents						X				
financial accounting and controlling	X									
investment	X									
knowledge on process-driven company structures							X			
labour leasing										X
legal / compliance / contract design			X	X			X			
knowledge of market development and supplier base as well as on factors of influence (economy, politics, law ...)					X					
negotiation						X				
networking / relationship building		X								
patience and didactics			X							
persistence and assertiveness				X						
pricing	X									
proactive teambuilding and coordination								X		
process development and -mapping							X			
special legal knowledge in procurement (private) law						X				
project management							X			
special legal knowledge in public procurement law						X				
special legal knowledge for buying services (labour law and jurisdiction)										X
specialized knowledge "purchasing and supply management"				X						
teaching (explaining, training, presentation)			X							
deeper technical commodity expertise (depending on customer department)					X	X				
understanding of DFS corporate structure and culture							X			
willingness and ability to share knowledge		X	X			X				X
willingness and ability to solve problems				X	X				X	

Table 4 - Interview analysis results

An example of how the developed competency model could be applied in business practice is presented in paragraph 5.5.

4.4 Phase 3: Model verification

The following paragraphs outline the process of conducting participant observations at DFS purchasing department as well as the qualitative analysis of observation data. An introduction and justification of the observation method is presented in Part C (3.4.3.1).

4.4.1 Observations at DFS purchasing department

Within a timeframe of three months (September – November 2013), 35 participant observations were conducted at DFS purchasing department. The observations results served to answer research question C.

Does the purchasing professionals' self-image on competency requirements reflect business practice?

Sub-questions

- *Is there implicit knowledge of competency needs?*
- *Does the model need to be amended?*

Observation candidates. As outlined in Chapter 3, the observation method is very time consuming and difficult to conduct. The limited timeframe for the DBA project demanded for a decision about the group of purchasing professionals to be observed. As it would not be possible to observe all DFS purchasing professionals, the researcher had to make an informed and reasonable selection of participants. The decision to conduct observations and to decide for a selection of purchasing participants to observe was influenced by the following considerations:

- Observations mainly serve to verify and further substantiate model contents.
- The majority of purchasing professionals' activities and corresponding competency needs were identified in the model development phase.
- Due to the comprehensive process of model development, data quality is believed to be already very high. The reasons for this are the high questionnaire response rate, the additional consideration of customer and management interview data as well as the processing of interim data through the Expert Forum as element of iteration.
- Some additional activities and competency needs might be revealed through participant observations.
- These new insights could best be gained when observing experienced professionals in advanced purchasing positions or key players / exemplary performers at purchasing department.
- It makes sense to observe few selected high-level participants and not to include low level employees or professionals with a predefined and limited scope of standard activities. It is assumed that these activities and corresponding competency needs are already covered by the model.

For the above reasons, it was discussed with purchasing management to decide on a selection of purchasing professionals to observe. A group of five purchasing professionals was proposed for observation by the researcher. This selection represents approximately 15% of the target population. The selected persons have at least 10 years of experience in DFS purchasing department or are considered key- or exemplary performers. The selection was accepted and confirmed by the CPO.

Observation candidate's informed consent. Informed consent of observation session participants was not obtained through the informed consent form as introduced earlier. The reason for this is that at the time of distribution of the form, it was not yet decided that observations will be conducted at all. However, informed participant consent was obtained through informing the selected purchasing professionals about the need and plan to conduct observations and asking them informally whether they would agree to be observed in various working situations. It was expressly made clear that the same standards regarding use of data and protection of participants as applied for the questionnaire and interview phase will be valid for the observations. From the five purchasing professionals who were asked for participation, all expressly agreed to take part and to further support the case study. Their statements of consent were documented and filed with the informed consent forms.

Quantity and locations of observations. The final number of observations was not limited or planned in advance. However, after conducting approximately 30 observations, it appeared that saturation was reached and that no new and useful information to answer research question C could be collected. However, five additional observations were conducted, but as no new insights could be gained from them, conducting observations was ceased. All observations were conducted by the researcher during normal office times in different office settings and situations (events) at DFS purchasing department in Langen, Germany. Four different kinds of events were chosen by the researcher as suitable and promising for conducting participant observations:

- informal internal meetings (members: purchasing professionals only)

- cross-departmental meetings (members: purchasing, customers)
- external meetings (members: purchasing, customers, suppliers, others)
- random office working situations (purchasing professionals working alone or interacting with peers, management, customers or suppliers)

The above events were considered promising because from the researcher's experience, they represent a reasonable selection of standard office situations and scenes where purchasing professionals' activities might demonstrate important competency needs. An overview of the observations conducted is shown in Table 5 below.

event	location	participants	duration (mins.)
informal meeting	meeting room	purchasing professionals	22
informal meeting	meeting room	purchasing professionals	25
informal meeting	meeting room	purchasing professionals	48
informal meeting	corridor	purchasing professionals	10
informal meeting	corridor	purchasing professionals	16
cross-departmental meeting	meeting room	purchasing professionals, customers	36
cross-departmental meeting	meeting room	purchasing professionals, customers	45
cross-departmental meeting	office	purchasing professionals, customers	55
cross-departmental meeting	meeting room	purchasing professionals, customers	20
cross-departmental meeting	meeting room	purchasing professionals, customers	110
cross-departmental meeting	office	purchasing professionals, customers	44
cross-departmental meeting	office	purchasing professionals, customers	25
cross-departmental meeting	office	purchasing professionals, customers	39
cross-departmental meeting	meeting room	purchasing professionals, customers	62
cross-departmental meeting	office	purchasing professionals, customers	19
external meeting	meeting room	purchasing professionals, customers, third parties	68
external meeting	meeting room	purchasing professionals, third parties	88
external meeting	meeting room	purchasing professionals, customers, third parties	51
external meeting	meeting room	purchasing professionals, third parties	36
external meeting	meeting room	purchasing professionals, third parties	122
external meeting	meeting room	purchasing professionals, third parties	110
external meeting	meeting room	purchasing professionals, customers, third parties	68
external meeting	meeting room	purchasing professionals, third parties	48
external meeting	meeting room	purchasing professionals, third parties	52
external meeting	meeting room	purchasing professionals, customers, third parties	74
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180
office working situation	office	purchasing professional	180

Table 5 – Observation event overview

Preparation of observation sessions. Prior to the conduction of observations, a field-note sheet which considers the suggestions as described earlier was prepared. Also, the time schedules of the selected candidates were checked for suitable events to be observed. Where possible, a place for an observation was chosen and reserved prior to the beginning of the meeting. At some events, the researcher (observer) played an active role in his function as purchasing professional. In order to keep these events as natural and undisturbed as possible, the participating candidates were not additionally informed about the fact that this particular event was being observed. However, when events were being observed in which the researcher did not play an active role as purchasing professional, the observed participants were informed about the reason of the researchers presence to the event. Due to the researcher's insider position and developed trust among study participants, the majority of above observations could be prepared and conducted fairly unnoticed by the participants, which I argue added to the quality of data collected.

Duration and documentation of observations. Observations took between ten minutes and three hours, depending on the individual event observed (Table 5). Mack et al. (2005) confirm that there is no best practice regarding the duration of observations, but that it depends on the setting and the population of interest. However, observation times were sometimes predetermined through the durations of chosen meetings to observe. The observations were documented through handwritten field-notes during the observed event and through additional narrative writing after the event. In cases where the

researcher was interacting with other participant during the observations, the majority of field-notes were taken directly after the observed event.

4.4.2 Observation analysis

The qualitative analysis of observation field-notes was guided by the following questions:

- *Which activities were performed by the observed purchasing professionals?*
- *Which competencies were applied when performing these activities?*

As Creswell et al. (2003) confirms, various ways may be taken in order to analyze observation data in a search for patterns and themes. Following the guiding questions above, the observations in this case study were analyzed through identifying recurring, frequent activities of DFS purchasing professionals as well as the competencies applied when performing these activities.

As described in Chapter 3, analyzing observation data aimed to verify the developed competency model with a special interest in identifying those purchasing activities and competencies applied which did not emerge through analyzing the self-image of purchasing professionals (questionnaires).

Purchasing activities as well as applied competencies were identified through analyzing the filed notes made during and after the observations. The analysis was conducted by following a predefined process. This process was designed to ensure the field-note analysis being systematic and its results to be comprehensible and replicable.

4.4.2.1 Field-note analysis process overview

The field-note analysis aimed at identifying the activities actually performed by the purchasing professionals as well as the applied competencies. The systematic analysis was supported by a process (Figure 53) and the field note sheet structure (Annex 7). From all objectively observed and noted facts (what happened?), purchasing related activities were identified by the researcher during and after the observations. Then, an even more subjective interpretation and definition of the applied and most important purchasing competency needs was developed.

Identification of purchasing activities. The purchasing related activities performed during the observed events were identified, grouped and coded. Then, the identified codes were compared to those discovered through the questionnaire analysis. Through this process, it was possible to

- *confirm* the purchasing activities as already identified through the questionnaire analysis
- *identify additional* purchasing activities which are obviously frequently performed, but were not mentioned by the purchasing professionals when filling out the questionnaires (new activity)

All observed activities and assigned codes are presented in Table 6 and Table 7 (p. 317 – 318).

Identification of applied competencies. After identifying purchasing activities, data analysis aimed at finding out whether new insights on applied competencies could be identified from the observed activities. Consequently, the identified activities were further analyzed to figure out the competencies

which were applied during their performance. Even in case activities were already identified through the questionnaire analysis and therefore part of the developed model, they were not yet dropped from the analysis process. Instead, all observed activities were kept in focus and analyzed for new insights on competency needs. In case no new insights could be gained, the activity was dropped and not further regarded. In such cases, no new competency needs could be added to the competency model. In case new competency requirements could be identified, they were added to the competency model.

The process of analyzing the observation field notes is illustrated in Figure 53 below.

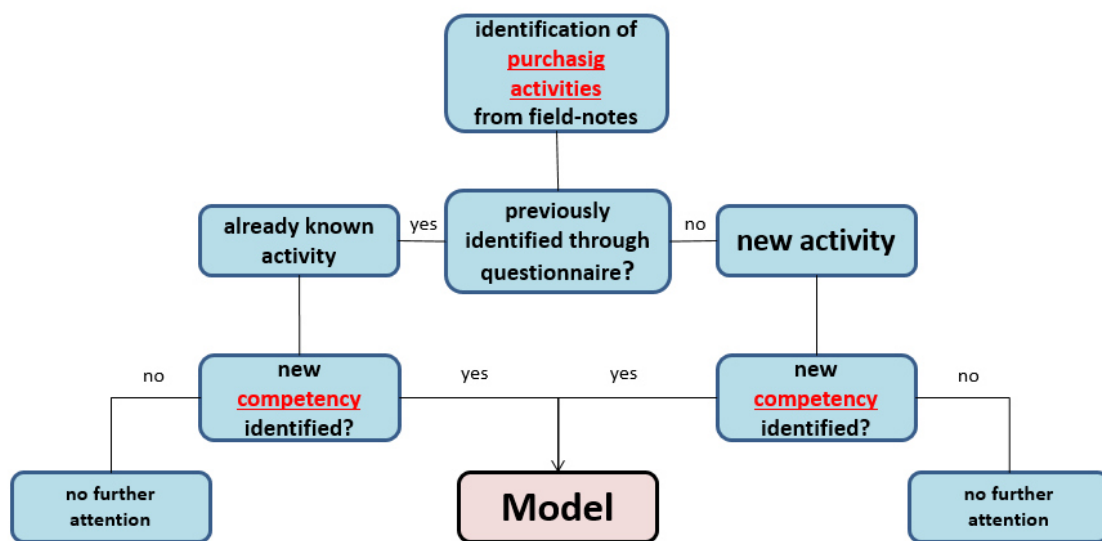


Figure 53 – Observation field note analysis process

The following paragraphs outline the process and results of identifying purchasing activities and applied competencies from the observation field notes.

4.4.2.2 Purchasing activities performed during observations

In the first step of analyzing the observation field-notes, all relevant activities of purchasing professionals were identified and transferred to an Excel table (matrix). Working with an Excel matrix once again was helpful to display, arrange and group the different activities performed by purchasing professionals. Processing the observation raw data in this way appeared reasonable because purchasing activities were performed constantly, unexpected, and often simultaneously during the observations. Also, activities were sometimes difficult to distinguish, especially when they were performed simultaneously or in short intervals. Quite often it was not clear when a particular activity started or ended because activities constantly merged and overlapped. This resulted in extensive and sometimes messy field-notes, which needed to be displayed and arranged in order to make better use of the data. The matrix helped to achieve this.

However, a number of activities observed were not purchasing activities, but more preparing, accompanying or completely irrelevant activities. These activities were not considered specifically related to the purchasing function and for this reason not regarded as valuable for identifying competency needs from them. Such activities included for example dressing, eating and drinking, cleaning up, private communication, or preparation of the workplace, the meeting room or the technical infrastructure. Using the matrix helped to focus on those activities which directly relate to DFS purchasing.

From the field-notes, approximately 140 purchasing related activities were identified. Through grouping closely related activities or activities that build on each other, 15 coded purchasing activity groups were developed.

Then, the coded activity groups were compared to those activity groups which were developed through the questionnaire analysis. When looking back at the questionnaire analysis results, a total number of 21 activities were identified. These of course include also those activities rarely performed by high level purchasing professionals, which were those being selected for observation.

Of the 15 observed purchasing activity groups, nine were already identified through the questionnaire analysis and coded for use in the competency model. Observed purchasing activities which were already identified through the questionnaire analysis are summarized in table 6. Even though these activities are already mostly covered by the developed competency model, they might later serve as basis for deducing new competency needs.

	observed activities (grouped)	codes as developed in questionnaire analysis
1	clerical and organizational administrative activities like printing, (electronic) filing, updating lists, processing mail, coordination of dates, meetings and travelling, writing standard business letters, email, reports or minutes of meetings,	administration (DC)
2	ERP system data input and output, transfer of contracts to ERP system, building of reports, determination of indicators and indices, maintain databases, checking contractual agreements and detail upon customer request, provide advise in case of incorrect / incomplete supplier performance, handling contract extensions, collect approvals and signatures, digital archiving of contractual documents, providing information and clarifying contractual wording with invoice audit department or other internal departments, making changes to contractual documents for technical reasons, time schedule reasons, personal reasons or financial reasons,	contracts / order management (BC)
3	respond to customer and supplier inquiries, informing suppliers on competition results, explaining processes to internal customers, reporting to management, provide supplier information like service portfolio, contact persons and supplier rating,	point of contact for customers and management (CB)
4	clarifying customer needs, scrutinize customer statements on requirements, requesting further information like expanded statement of work, informing customers about similar requests or existing internal know-how, matching customer needs with supplier portfolio, preselection of possible suppliers, searching / sourcing new suppliers, requesting supplier information (portfolio, prices...), interviewing potential suppliers, arrange direct contact of customers with suppliers,	needs assessment/ demand analysis / market investigation (BA / DA)
5	invitation to submit quotations, preselect / propose suppliers to customer, forward offers and decide what parts of offers the customer should receive, evaluation of offers, provide own expertise / experience to customers, decide about contract award (in coordination with customer), documentation of purchasing process,	order processing (BB)
6	handeling internal customer requests, keep overview on all purchasing activities in purchasing group, distribute tasks in team, instruct team members, explain procedures and (best) ways of proceeding, actively adress conflicts with customers, suppliers or management, motivation and coaching of team members, development and communication of action plans, stand up against internal customers, explain standpoint, convincing and generation of win-win situation, design of complex contracts and other contractual documents, push on public procurement projects, take over the leading role in (public) procurement projects,	operational (non disciplinary) leadership (CA)
7	obtain complete overview and keep control over public procurement process, compiling documents necessary for initiating public tender process, initiating / attending / leading coordination meetings, discussing possible ways and margins of public tendering projects, proposing feasible / practicable methods and possible scope of actions / room to manoeuvr, keeping an eye at compliance with legal provisions and internal regulations, preparation of tender documents, supporting customers in preparing technical documents, handling internal and external correspondance in tender process (including english correspondence), risk evaluation and coordination of activities / measures / sanctions with legal department, influencing tender process to establish legal certainty, handling / preparing public procurement law review proceedings before the public procurement chambers, documentation of tender process,	public procurement / competetive tendering (DB / GA)
8	analyzing purchasing statistics, creating reports, using software and electronic purchasing systems, preparation of presentation based on calculated numbers and figures, providing relevant information as basis for decisions for purchasing and top level management, balancing customer needs and interests and supplier situation,	management reporting (EC)
9	discuss strategic purchasing opportunities / decisions with purchasing management, outlining basis for decision making, balancing pros and cons, convincing management or customers of advantages or disadvantages, escalating decisions,	strategic purchasing decisions (GB)

Table 6 - Observed activities (already covered by the model)

Six groups of activities were observed which were largely new and not already defined before through the questionnaire analysis (Table 7). It is interesting to note that during observations, such a significant number of purchasing activities was identified which were not particularly named by the purchasing professionals themselves through the questionnaire. A discussion of the reasons for this surprisingly high number of new activities will be provided further down.

10	<i>cost analysis considering total cost of ownership, coordination of budget related issues with customer and financial controlling department, reading and bringing in question customer project calculations, checking pricing tables and calculations, requesting proposal calculation base from supplier, identifying cost saving potential,</i>	<i>cost control activities</i>
11	<i>conduct spend analysis, developing sourcing plans, handle enquiries from potential and existing suppliers, matching customer needs with existing and potential supplier base, conducting market research, advise internal customers regarding technical solutions, supplier base, market, conditions or prices, drafting contracts for special commodities / services,</i>	<i>activities of a commodity expert</i>
12	<i>informing internal customers about purchasing process and related processes and individual responsibilities, explaining public tender process to internal and external addressees, share best practice information among colleagues, report experiences on complex purchasing projects to management, calling attention to possible pitfalls in purchasing projects and contracts, provide and discuss draft and model documents (statements of work, specifications, contractual documents), informal presentation of project status to colleagues and management,</i>	<i>sharing of knowledge / information</i>
13	<i>reviewing and discussion of technical tender documents, evaluation of tenders / proposals and discussion of results with internal customers, clarifying responsibilities and authorities in purchasing and related processes, working towards early purchasing involvement, negotiation of proposals / contracts / prices and price calculations with suppliers, insisting on and argumentation of purchasing involvement in supplier sales activities at DFS, conducting / attending team meetings, allocation / discussion of tasks and responsibilities, coordination of joint actions and perspective, arranging common team approaches, team negotiations with suppliers and customers,</i>	<i>conflict resolution and team activities</i>
14	<i>drafting and negotiation of complex contracts and other contractual documents (german and english language), informing customers and management about actual case law / application of law, applying laws and regulations to actual cases / purchasing processes, communication with legal department and external lawyers, drafting of model agreements and text blocks (boilerplates), identification and processing of relevant new legal information and communication with peers, customers and management,</i>	<i>advanced legal related activities</i>
15	<i>addressing and solving legal problems related to the procurement of services, drafting and negotiation of service contracts (german and english language), contracts with freelancers, body leasing and contracts about services with a specific result (Werksvertrag), activities to avoid contracts on 'pseudo-self employment' (especially with freelancers) and advising of management and internal customers of risks and legal possibilities in actual purchasing projects, working towards building new supplier base and development of existing suppliers,</i>	<i>buying services</i>

Table 7 - observed activities (largely new and not yet covered by the model)

4.4.2.3 Applied purchasing competencies

The next step in analyzing the observation data was to reflect on the observed activities and to identify the competencies applied by purchasing professionals during their performance. The goals of this step were to

- verify whether those competency needs identified through the questionnaire are really those applied in business practice
- explore additional competency information which would be a valuable add to the developed model

As the following analysis shows, new competency needs were identified from both the newly discovered activities and those who are already included in the model.

New competencies observed in activities which were already identified from the questionnaires

Even though many of the observed purchasing activities along with corresponding competency needs are already part of the competency model, new competency requirements could be concluded from these activities. From the nine observed activities which are already included in the competency model (Table 6), two competency needs were identified which were not mentioned by purchasing professionals in the questionnaire phase as important for these activities.

- ability to delegate
- english language skills

Both English language skills and the ability to delegate were observed to be important competencies for the activities under the tasks *Purchasing Level 1*,

Purchasing Level 2 and *Team Coordination*. Both above competencies were applied frequently by the observed purchasing professionals when performing activities under these tasks.

The ability to delegate belongs to the most essential competencies for team coordinators as they act as single point of contact for most customer, supplier and management enquiries. Without the ability to delegate activities, team coordinators would be overburdened with work within a short timeframe. Team coordinators serve as distribution nodes for all kinds of purchasing activities, customer enquiries, work orders, requests, etc. The fact that the ability to delegate is crucial for team coordinator's activities can also be confirmed from my own experience. For six years, one of my main tasks at DFS purchasing department was team coordination. From this perspective, it can be said that among the most important things a team coordinator has to learn when taking over this task is to delegate activities to his subordinated team members. As a team coordinator takes over responsibility for a purchasing team's activities and performance, he needs to make sure the workload for every team member is balanced right and that all purchasing activities are performed with a high quality standard and within a reasonable timeframe. This requires assigning activities to team members according to their individual strengths and weaknesses while balancing time schedules and pressure, learning needs, individual preferences and own goals. This often turns out to be very difficult because it is the first step to take on a management and leading function within purchasing department and basically involves saying colleagues what they have to do. This is an unfamiliar, challenging and also very responsible

authority (competence) and it turned out in the past that some purchasing professionals had difficulties to handle this.

English language skills were also observed to be very important for purchasing professionals, especially team coordinators who are often the first point of contact and regarded to be competent in handling all external requirements. Many purchasing activities observed involved working with English documents, English speech, international phone calls, English meeting- or contract-language, specification documents, or website information. Even though English language is established as business language in many German companies, DFS lags a bit behind this trend. However, DFS top management accelerated the switch to English language in many company divisions and also purchasing department is affected by this. Looking back at the questionnaire analysis, it is surprising that the purchasing professionals' self-image did not reveal English language skills as important. One reason for this could be that many purchasing professionals resist the trend to talk more English or consider it redundant, not necessary or as an end in itself.

However, as the observation of purchasing professionals revealed a need for good English language skills and the ability to delegate, both new findings on were added to the competency model under their respective activities.

Regarding the general value of observations, the following can be said. Only few specific competency needs for team coordinators were identified through the questionnaire analysis. It turned out that observing purchasing activities can be a good method to identify new insights on competency needs, especially in cases where other methods (like the questionnaire) brought only limited results.

Competencies observed in activities which were not already identified from the questionnaires

From the six groups of observed activities which are not already identified through the questionnaires (Table 7), a number of new purchasing competency requirements could be identified.

Cost control activities. In order to perform the observed cost controlling activities, purchasing professionals demonstrated competencies in analyzing and understanding cost structures of products and services. Special knowledge in examining customer project- and purchasing-budget calculations with regard to total cost of ownership considerations was applied by observed professionals. The ability to undertake and discuss make-or-buy analyses and to balance arguments with internal customers and suppliers were observed to be of special importance. Also, a high level of experience in developing ideas to successfully bring in question supplier price calculations and arguments against increased prices have been observed. The ability to discuss financial aspects of (purchasing) projects and customer project plans with the goal to identify and influence real acquisition costs and propose activities to achieve savings was further identified as important competency. Solid basic knowledge in finance, accounting and controlling can therefore be identified as important competencies of purchasing professionals in advanced purchasing positions. The above competency needs were only rarely mentioned by the purchasing professionals in the questionnaire. However, because of their frequent application during the observations, they are considered an important component of the competency model.

Activities of a commodity expert. In their daily business to support internal customers, most purchasing professionals are actively concerned with recurring customer requests for the acquisition of specialized goods and services. Hereby, purchasing professionals were observed to develop systematic approaches in using purchasing tools for the main categories of goods and services they frequently buy. The abilities to conduct spend analyses and market researches as well as the development of sourcing plans were observed as frequently applied by the observed purchasing professionals. Hereby it was also demonstrated that a huge variety of information was provided to customers regarding product details and variations, specifications, characteristics and features, supplier markets, experiences and credentials, specifics in contract design as well as market prices and conditions. Also, based on advanced knowledge and competencies of certain commodities, purchasing professionals were able to ask critical questions about customer requests or technical specifications provided. Customer claims of uniqueness of requested suppliers (single source) could often be countered based on deep commodity expertise and market experience. In many cases, purchasing professionals' expertise and arguments led to changed specifications. Detailed knowledge of buying markets, products and services turned out to be especially important to work towards and argument for competition instead of direct contract awards. Remarkably, the need for commodity expertise, the respective purchasing toolkit and technical know-how was rarely mentioned by purchasing professionals when asked for their most important competencies in the questionnaire.

Sharing of knowledge and information. Providing all kinds of information and knowledge to peers, management, customers and suppliers was observed as one essential and frequently performed activity of purchasing professionals. Most importantly, purchasing expertise and insider information was shared with other purchasing professionals, especially team members. Hereby, shared knowledge ranged from information regarding the current state of purchasing projects over expert knowledge on purchasing best practice and experience with suppliers or customers to important news on legislative trends or application of law to name just a few. Sharing information with purchasing- or higher-management was also often observed. Especially information related to tender results, success of purchasing activities or key performance indicators constantly needs to be provided to third parties. Also, providing information to purchasing customers, for example explaining processes, rules and regulations or regarding the application of purchasing tools, design of contracts or negotiation tactics was frequently observed. However, it seemed that different purchasing professionals demonstrated different levels of willingness and ability to share knowledge. Those who showed more patience and didactical competencies and those who actively strived imparting knowledge received a lot more positive feedback from their customers or peers for this activity. Generally, good skills in communication and teaching facilitate the sharing of knowledge. Even though positive feedback was often instantly provided to those who actively shared knowledge, corresponding competency needs were not underlined by purchasing professionals when filling out the questionnaire on purchasing competency needs.

Conflict resolution and teaming activities. Purchasing professionals constantly have to deal with conflicts arising especially with internal customers and suppliers. Consequently, activities of dealing with conflicts and seeking conflict resolution were demonstrated numerous times. Most frequently, conflict situations occurred where purchasing and customer departments or suppliers pursued contrary goals. Also, situations where customers did not acknowledge or questioned the ability to add value, develop strategy, goals or requirements regarding task sharing and customer's responsibilities in the purchasing process led to conflicts. Therefore, the application of competencies to solve conflicts, to balance needs and expectations as well as to make clear the advantages of (early) purchasing involvement was observed as crucial for successful de-escalation and resolution of conflicts. Good argumentation for the creation of value added to the customers was often supported through demonstrating competencies in financial and legal disciplines. Also, expertise in requested commodities and technical understanding and knowledge as well as the ability to discuss at eye level with customers helped solving conflicts. The ability (and willingness) to team up with customer departments even when conflicts exist and mutually focusing on external factors influencing the achievement of joint objectives further facilitated conflict resolution.

Advanced legal activities. In accordance to purchasing department's self-image, a large variety of legal activities were performed by purchasing professionals. However, the observed legal activities go far beyond those reported by purchasing professionals through the questionnaire survey. For example, the drafting and negotiation of complex contracts in German and English language or professional communication with internal and external

lawyers were observed to be frequent activities of purchasing professionals in certain job levels. Such activities demand for a much more specialized set of legal competencies compared to those needed for lower level legal activities such as drafting contracts by compiling standard text blocks. In order to provide good legal service to internal customers it is also necessary that purchasing professionals have a good overview on relevant rules, regulations and application of law and a deeper knowledge of legal pitfalls in purchasing activities. Especially in volatile areas of law such as German public procurement law, purchasing professionals need deep and up to date legal expertise. The willingness and interest to further develop legal competencies and understanding in public procurement and private law was demonstrated especially by those observed professionals who are directly responsible for the legal compliance of purchasing projects or contracts. Also, the ability to apply newly acquired legal knowledge in current purchasing projects and to share legal know how among peers and internal customers was identified as crucial during observations. Furthermore, the abilities to discuss contents of contracts with internal customers, to simplify legal language and to negotiate terms and conditions with suppliers by balancing different interests and mutual goals was observed to be a success factor of purchasing activities. Again, most of the above competencies were not reported by purchasing professionals as important through the questionnaire.

Buying services. Outsourcing activities and customer decisions to switch to external service providers and contract-personnel rather than hiring long term employees or carrying out tasks internally leads to increasing activities in purchasing, for example in the acquisition of services, temporary employees

and freelancers. Buying IT services, software programming, documentation or IT project management as well as temping were observed to be frequent activities of purchasing professionals. Special competencies in drafting contractual terms and conditions of above types of contracts as well as knowledge of this very special market are prerequisites for performing such purchasing activities. It was also observed that internal customers need special assistance when planning to buy external (IT) services. Uncertainty and a serious need of advice could be observed at customer side. Special knowledge in the fields of avoiding 'pseudo-self-employment', special liability risks and difficulties to differentiate the various forms of contracts lead to the need of advanced and specialized competencies on the purchasing professional side.

4.4.3 Observation findings summary

Before answering research question C based on the observation results, this paragraph summarizes the findings from this final step of data collection. In order to reach the goal of model verification, purchasing professionals' self-image on competency needs was matched against actual behavior in business practice. The behaviour of purchasing professionals was expressed through activities performed as well as competencies applied and was explored through participant observations.

As described earlier, only a selection of purchasing professionals was chosen for observations. For this reason, not all activities and competency needs as explored through the questionnaire analysis could be verified through direct observations. Especially low-level activities of basic purchasing professionals

were rarely observed, but it was anticipated by the researcher that observing high level and high performing professionals would bring more benefits in terms of identifying new and important purchasing competencies which could possibly expand the developed competency model. The researcher is well aware that this approach *might* lead to some unverified model contents, but argues that due to the overall approach of model development, the danger of having wrong data in the model is very low. However, observing purchasing professionals brought many new and interesting insights. Firstly, the observations revealed which activities are frequently performed by DFS purchasing professionals in business practice. By applying a standardized process, 15 activities and corresponding competencies were identified and coded from the observation field notes. When comparing these results with the questionnaire results, it becomes apparent that the two data sets largely match regarding the performed purchasing activities. This shows that the target population's self-image is was large parts confirmed by business practice. Figure 54 below illustrates to what extent the observation data matches the findings from the questionnaire.

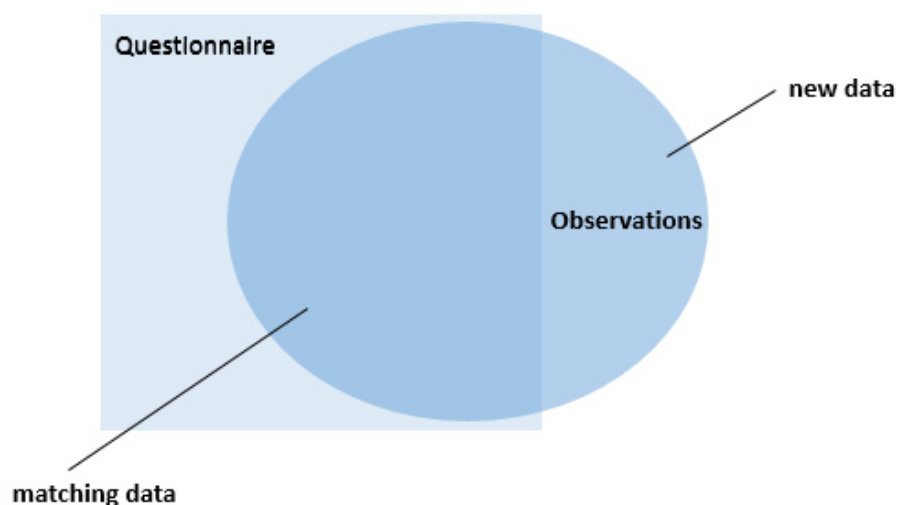


Figure 54 – Observation data partly matches questionnaire data

However, the observation analysis also revealed new data. New data in this respect is defined as activities and competency needs which were not already identified through the questionnaire analysis. Six of the above activities along with their corresponding competency needs identified are therefore considered new.

All observed activities - new ones and those already identified through the questionnaire analysis - were analyzed for the competencies applied during their performance. Two previously not included competency needs (English language and delegation) were identified from those activities already included in the model. These newly discovered competency needs were added to the competency model.

Then, by analyzing the field-notes and through reflecting on the observed *new activities*, the competencies applied by purchasing professionals during performance were identified. These applied competencies were considered as important competencies and potential improvements for the competency model. The competency needs identified from participant observations are described in paragraph 4.4.2.3.

It is interesting to note that many observed activities and corresponding competency needs were not mentioned as important by the purchasing professionals through the questionnaire. A discussion on possible reasons for this effect are presented in Chapter 5.

4.4.4 Answers to research question C

Research question C was posed to verify the developed competency model and to bring in question the importance of implicit participant knowledge when developing competency models.

Does the purchasing professionals' self-image on competency requirements reflect business practice?

Sub-questions

- *Is there implicit knowledge of competency needs?*
- *Does the model need to be amended?*

Based on the observation results as outlined above, it can be said that the purchasing professionals' self-image does not completely reflect business practice.

The self-image of purchasing professionals was revealed through the questionnaire analysis. Comparing the observation results with the questionnaire findings shows that from 15 observed purchasing activities, only nine match with those identified through the questionnaire analysis. This means that more activities and applied competencies were observed than the questionnaire analysis revealed (Figure 54).

The question is why are there were so many activities observed that were not reported as important by purchasing professionals. Also, it should be discussed whether this finding leads to an amendment of the developed competency model. For this reason, the two above sub questions were posed.

Implicit knowledge on competency needs

By considering the definition of implicit knowledge, it becomes obvious that the reason why new activities and applied competencies were observed is the existence of purchasing professionals' implicit knowledge about competency needs. The fact that activities and competency needs were observed which were not mentioned in the questionnaire shows that purchasing professionals were not aware of them and could not formulate them when filling out the questionnaire. A discussion and implications of the above findings are presented in Chapter 5.

Need for model amendment

The question for the need to amend the competency model based on the finding that implicit knowledge exists requires a differentiated answer. Generally speaking, the answer is yes. As the above data analysis shows, developing a competency model without considering implicit participant knowledge on competency needs might lead to a model which does not fully reflect business practice. The modeling process should therefore include methods to identify implicit participant knowledge on competency needs. In case implicit knowledge is identified, it should be considered in the model. However, with regard to the case study in hand, the following can be said.

As Figure 55 below illustrates, all new data observed is covered by the public-image on important purchasing activities and competencies. The public-image on purchasing activities and competency needs was identified through analyzing interview data in study phase 2. As this data already found its way into the competency model, there is no need to further amend it.

Even though implicit knowledge on competency needs was identified through the observations, the fact that these competency needs were already identified through the interview analysis makes the need to further amend the developed competency model obsolete.

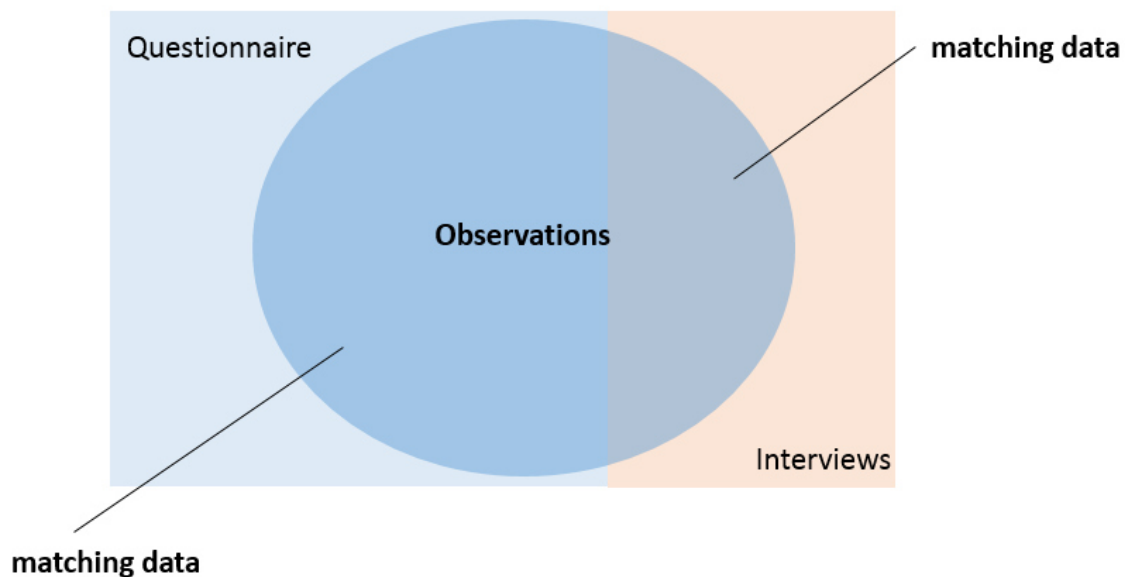


Figure 55 – Observation data matches questionnaire data and interview data

Summarized, it can be said that implicit knowledge should generally be considered in model development. Observations have proved to be a good method to reveal implicit knowledge. Regarding the case study in hands, it seems not necessary to further amend the existing model with the observation data because purchasing customers provided largely matching information through the interviews. A more detailed discussion of the observation results and the role of implicit knowledge in the process of competency modeling is presented in Chapter 5.

4.4.5 Expert Forum workshop 3

The third and final Expert Forum workshop pursued two goals.

Firstly, it aimed at developing definitions for the model's superordinate purchasing tasks. Finding definitions for the developed tasks seems reasonable because since they were coded during model development, no explanation was provided for them. Secondly, it aimed at discussing the need for behavioral anchors for use in the developed competency model. The Forum workshop was conducted after model development and verification and did not aim at further revising the model contents, but to concretize the developed model in terms of definitions and decide about possible additional steps. As the goals seemed straightforward and manageable within a short timeframe, the workshop was planned as standard meeting and conducted less structured and less moderated compared to the first two Forum workshops. Regarding the development of definitions, two approaches were considered possible by the researcher:

- a. Researcher develops draft definitions which are then processed (reviewed and discussed) through the Expert Forum.
- b. Approach to develop the definitions from scratch, which includes the collection and analysis of data as part of the Expert Forum workshop.

It was decided by the researcher to follow approach a. for the following reasons. Firstly, the researcher is familiar with the organization and environment and has deep insights in the focused topic. Secondly, the terms to be defined were developed by the researcher based on collected primary data in the model development phase and can therefore be described based on this knowledge and experience. It is therefore anticipated that high quality

drafts can be developed by the researcher. Thirdly, jointly developing definitions from scratch would cause big effort and a considerable amount of time with a questionable value-add compared to following approach a.

a. Definition of purchasing tasks

For the purchasing tasks as developed in the competency model, it appears reasonable to provide definitions in terms of plausible descriptions. The goal was to find short, but meaningful definitions in order to create a common understanding of model contents and basis for discussions in possible future model revisions.

Draft definitions were developed by the researcher prior to the workshop and presented to the Forum members on a whiteboard. Based on these drafts, a group discussion arose. In some cases, the discussion served as a basis to revise the developed drafts, but most of the times the discussions resulted in only minor changes in definition wordings. The reasons for this straightforward processing and quick gaining of results might be that due to the participatory approach followed throughout the whole project, the Forum members already had a common understanding of model contents and definitions. Also, all Forum members agreed that the definitions to be developed should be short and catchy, which probably prevented the more creative and extroverted Forum members from excessive discussions and trying to enforce their personal views. Especially the latter indicates that the decision to jointly work on the competency model was the right approach.

The definitions as developed through the Expert Forum were added to the DFS purchasing competency model (see pages 302-305).

b. Discussion of need for behavioral anchors

A behavioral anchor can be defined as description of an exemplary practice or behavior assigned to a defined competency. According to Deloitte (2014), a behavioral anchor is a specific example that demonstrates a competency level and in this way defines the competency itself. The researcher agrees to the common view that behavioral anchors can help *users* of a competency model to better understand the model details and how to apply the model. To discuss the need to add such behavioral anchors for the developed competency model, a discussion was initiated by the researcher aiming to answer the following questions:

- *What could be benefits of defining behavioral anchors for the DFS purchasing competency model?*
- *How should behavioral anchors be implemented in the DFS purchasing competency model and which approach would be reasonable?*

The discussion results were documented by the researcher in handwritten bullet point form and later used to summarize and report the following discussion outcomes. The Forum members agreed that defining behavioral anchors ensure that every potential user of the competency model has the same understanding of a defined competency and that they facilitate and support more objective assessments of competencies. Behavioral anchors should be precise, reasonably specific and easy to apply. However, it was remarked by two Forum members that defining behavioral anchors alone will not be enough to enable model users to reasonably apply the model and to make use of its potential benefits. This remark was discussed and all members agreed that in case the model would be implemented in DFS purchasing department, a considerable amount of effort would also be necessary to

explain usage, advantages and opportunities of the model. Summarized, the Forum came to the conclusion that behavioral anchors would add much to the quality and usability of the DFS purchasing competency model when done right. Regarding a reasonable approach to implement behavioral anchors in the competency model, the following was discussed. For each competency defined under the specific purchasing activities, a number of behavioral anchors should be developed. These anchors could then be organized on a scale, for example the common three level scale needs improvement, meets expectations and exceeds expectations. Each of these levels of performance should be exemplified with at least one, but better two or three exemplary behaviors (anchors). Preferably, these exemplary behaviors should not only include positive examples, but also negative examples or examples of inadequate or exaggerated behavior, especially for the needs improvement level. As Figure 56 shows, a 5-point scale could then be used to rate individual performance based on the developed behavioral anchors.

cooperational		Rating
needs improvement	prefers working alone and independent from team goals	1 or 2
	strong competitive thinking prevents cooperation with peers and management	
	focus on compromises and consensus is too strong and prevents bringing in individual strengths	
meets expectations	well-balanced between team integration and individuality	3
	focus on team objectives by bringing in individual personality and strengths	
	level of integration and communication supports reaching team objectives	
exceeds expectations	active and involved networker with ability to critically scrutinise and reflect on team activities	4 or 5
	shares knowledge in team and actively promotes team objectives	
	takes over initiative, coordinates teamwork and pulls the team together	

Figure 56 – Example of behavioral anchors and rating system

The Forum agreed that developing behavioral anchors would be very time consuming. Also, behavioral anchors once developed might underlie a steady change as the other components of the competency model do. Behavioral anchors should therefore be defined only in case the model is implemented. After model implementation, the anchors should be revised on a regular basis.

5. Summary, discussion and implications

This final thesis chapter provides a brief summary of the research study approach and process (5.1). It continues with a discussion of the overall study findings (5.2), which goes beyond the presentation of data collection and analysis outcomes as presented in Chapter 4. Whereas the latter focusses on the individual results gained to answer the corresponding research questions, the discussion here takes a more comprehensive and interrelated look on the study findings and experiences made by the researcher. The chapter also outlines the study's implications for the theory of competency modeling (5.3) and business practice (5.4). It finally points out limitations of the study (5.5) and highlights possibilities for future research (5.6).

The competency model for DFS purchasing professionals, which is the main outcome of the study in hand, is presented in paragraph 4.3. An example of model application for an open job position at DFS purchasing department is provided in paragraph 5.5.

5.1 Summary

The summary starts with a short overview on the literature review (5.1.1) before revisiting the research problem and objectives (5.1.2). It then briefly presents the study's methodology as well as the data collection methods applied for answering the research questions (5.1.3).

5.1.1 Literature review

The literature review was conducted systematically. Through a thematic synthesis of selected literature sources, it answered predefined questions which aimed to comprehensively approach the chosen topic and to define a knowledge gap (2.2).

The review outlines the general concept of competencies and identifies main streams of competency application in workforce development. It hereby underlines the trend to competency based human resources management in company environments through discovering prominent voices in competency modeling literature. Different approaches to competency identification (competency model development) are presented and discussed against the backdrop of this study's research goals. The review then focusses the literature view on competency needs of *purchasing professionals* now and in future and discusses themes frequently identified.

Additionally, a catalogue of purchasing competency attributes (supportive data) was identified from selected literature sources for further use in the study process (see 2.1.1 and 4.1.1).

5.1.2 Research problem and objectives

The lack of a competency model for purchasing professionals at DFS causes various problems in business practice. Although generic purchasing competency catalogues exist, no specifically tailored model for this professional group in the unique ANSP business or even DFS was ever developed. Previous purchasing competency studies give only little insight in

the process of competency modeling in specific company environments, activity based competency identification or participatory approaches for competency modeling. Besides, virtually nothing is written so far about implicit knowledge consideration in the process of competency modeling. The latter aspect is considered important by the researcher. There is the theory that people often can't verbally express what they know. As it is the goal of this study to develop a competency model by asking people what competencies are important, it might be a problem that it is largely unknown how to deal with this possible implicit participant knowledge or whether it is worth to be considered when it comes to competency modeling.

The objectives of this study were therefore

- to develop a reliable competency model for DFS purchasing professionals
- to inform the process and approach of competency modeling in the profession of purchasing and in a business environment where little is known about competency identification
- to contribute to the field of competency modeling by exploring the role of implicit participant knowledge in the process of model development

5.1.3 Methodology and methods

The research study is situated in my professional working environment, the DFS purchasing department. After balancing and discussing various research paradigms, I positioned myself as pragmatist researcher using the most appropriate methods for (research-) problem solving. Even though this attitude might shift towards even more subjective and interpretative paradigms for future research projects, a pragmatist approach is considered as perfect fit for

the DBA study in hand. A mix of inductive and deductive research elements, the chosen mixed method design to data collection and the approach to conduct a single case study respond to this informed decision.

The study design involves three subsequent phases. The first phase reviews the literature and collects supportive data for later use in model development. Phase 2 collects quantitative and qualitative data from which the competency model is developed. In phase 3, the model is verified through collecting observation data and through identifying implicit participant knowledge.

In the model development phase, quantitative as well as qualitative data was collected in a convergent parallel study design. Quantitative data was collected through a questionnaire among purchasing professionals. Qualitative data was collected through expert interviews with purchasing management and internal customers of purchasing department. From the quantitative and qualitative results, the competency model was set-up. Participant observations in phase 3 then aimed at verifying whether the self-image of purchasing professionals reflects what purchasing professionals actually do in daily business and what competencies they apply in their activities. Observing purchasing professionals in this way also served to reveal their implicit knowledge on competency needs.

During the case study, a group of internal experts (Expert Forum) processed interim data in different study phases. This iterative element helped ensuring high data quality, and was important to creating internal trust, consent and acceptance of the study results.

5.2 Discussion of findings

The following paragraphs provide a discussion of the overall study findings based on the individual results from the three study phases.

5.2.1 Phase 1: Preliminary

5.2.1.1 Literature review

When looking beyond the individual review findings as presented in the thematic literature synthesis (2.6), the following can be concluded.

It appears that the decision to conduct a systematic rather than a narrative review of the literature was right. In order to thoroughly search for research evidence in the field of purchasing competency modeling, a systematic review was an appropriate way. A large number of literature sources covering purchasing competencies were identified thanks to systematic search logic. Even though the need for an updated set of purchasing competencies is confirmed by many authors, competency modeling in purchasing environments was rarely subject of *research studies*, especially in Europe. It was therefore important to identify the few examples of original research on purchasing competencies. The selected approach allowed for identifying these sources systematically, which might have been difficult when conducting a narrative review.

However, the results of identified purchasing competency studies were often limited to simple top lists of general and mostly generic purchasing competencies. Industry specific studies, an activity based view or participatory approaches to purchasing competency modeling could rarely be identified.

Also, the review could not identify references of implicit knowledge consideration in competency modeling or even competency modeling in the ANSP industry, which is a very competency sensitive environment.

Systematically reviewing the literature base sharpened the author's view on the case-specific needs of competency modeling. Developing a comprehensive process to identify activity related purchasing competency needs of DFS professionals directly responds to the insights gained from the review. Given that a broad range of DFS purchasing tasks and diverse activities was identified during the cases study, it has emerged that an isolated and general list of purchasing competency needs would not meet the requirements of a DFS purchasing competency model.

The goal to develop a competency shortlist during the literature review for further use in the model development process (supportive data) was also successful. Through analyzing selected sources focusing on purchasing competencies, a number of top rated purchasing competency attributes were identified. Here again, a narrative review might have missed some important insights from earlier works in the field of purchasing competencies. The set of supportive data was processed through the first Expert Forum workshop and later successfully served to inform the model development phase as basis for the questionnaire survey. In terms of methodology it can be concluded that collecting competency data already during the literature review was an adequate strategy to support model development. The literature on general purchasing competencies turned out to be a good starting point for identifying DFS specific competencies, even when developing a competency model from scratch. To incorporate existing information on purchasing competencies also

corresponds to the researcher's pragmatic attitude and desire to make use of existing expert know-how. This idea was also supported by the deductive approach chosen for the literature review.

5.2.1.2 Expert Forum workshop 1

The decision to follow a participatory approach to competency modeling turned out useful. From the sources analyzed in the literature review, mostly generic purchasing competencies were identified as supportive data on a shortlist as outlined above. This indicates that the majority of earlier purchasing competency studies focus on the identification of generic competencies and rarely follow an approach to identify industry specific, job role or even activity related competencies. Through the Expert Forum support in this study, the developed shortlist of competency attributes was significantly expanded to reflect DFS organizational specifics and opinions of insiders to the study setting. By making use of company-internal expertise on purchasing competency needs, the shortlist was successfully enriched with DFS specific thoughts. Especially in areas where only few industry specific competency studies exist, the combination of the literature view with internal expert opinions is considered a useful way when conducting case studies on competency modeling. Introducing an Expert Forum and exploiting its knowledge and commitment in this early study phase was therefore advantageous. It created trust and consent and supported high reliability of the early competency data base. Summarized, it helped setting the grounds for more solid competency model development.

5.2.2 Phase 2: Model development

In study phase 2, the competency model for DFS purchasing professionals was successfully developed based on collected quantitative as well as qualitative data. Through a questionnaire survey, information on purchasing competency needs from the self-image of DFS purchasing professionals was collected (4.2.1). The questionnaire data was analyzed quantitatively. An Expert Forum workshop supported the process of data analysis.

In a parallel strand of data collection, expert interviews were conducted with purchasing management and internal customer representatives to collect qualitative data on competency needs from these diverse stakeholder perspectives (4.2.4). The qualitative set of data significantly expanded the set of quantitative data.

5.2.2.1 Questionnaire

Collecting competency data through a questionnaire was successful. The response rate of 91% indicates that the researcher succeeded in generating trust for the project and to convince the participants of the usefulness of the case study. The quantitative data analysis resulted in a breakdown of the seven main *tasks* of DFS purchasing professionals, the most important *activities* performed under each task as well as a catalogue of essential *competency needs* per identified activity. The questionnaire analysis results formed the basis of the competency model. All data used to build the above model structure represents the self-image of purchasing professionals.

From a methodological point of view, the following can be said. Generally, it can be concluded that the decision to develop a competency model from scratch for DFS purchasing professionals was right. The questionnaires revealed a rich and extensive database perfectly usable for the development of a competency model based on context-specific data. Developing the model based on existing, general purchasing competency data as identified in the literature review would have led to an unspecific, generic and incomplete picture of the actual purchasing professionals' activities and competency needs at DFS. Also, it appears that the study participants honored the easy and user-friendly questionnaire setup including the standard diagram and likert scale introduced for questionnaire data input. However, it is noticeable that the data collected through the questionnaire was mostly formulated short and simple and not as deep compared to the results from the later interview phase. This could be explained through the simple fact that the participants had not much space in the diagram provided to formulate their thoughts. As lessons learned and to eliminate the chance that this effects data quality, the diagram could be adjusted to allow for providing more complex, maybe even more narrative forms of information for future data collection. Then again it could be questioned to what extent the questionnaire should be a tool for quantitative data collection or maybe serve as tool to collect (also) qualitative data which then needs to be analyzed differently.

An *activity based view* on purchasing competency needs and collecting respective information turned out to be reasonable. Purchasing professionals with diverse tasks, but sometimes comparable or overlapping activities often stated similar competencies as necessary for their job. Considering them all

under one superordinate headline and not assigning them to specific purchasing activities would have drawn an unspecific, undifferentiated and diffuse picture of DFS purchasing competency needs. Furthermore, the initial identification of purchasing tasks as superordinate group for the following breakdown supports the reasonable use and application of the model, for example for creating job profiles. Two or three tasks could easily be combined to a purchasing job profile, with individual, sometimes overlapping activities and competency needs. This practice would correspond to the idea to develop a competency model which can be used as flexible and modular system by DFS purchasing management (see paragraph 5.5).

However, as the questionnaire includes different parts and methods to collect quantitative data, some additional thoughts regarding the use and structure of a questionnaire for model development seem necessary. A comparison of questionnaire part B and part C analysis shows that the participants seem to be unable to state all important information when given a blank diagram to fill with competency data. It seems that some participant knowledge on competency needs could only be revealed when directly asking for importance levels of pre-defined competency attributes. The fact that purchasing professionals did not come up with this information in questionnaire part B already indicates that implicit knowledge on purchasing competency needs is existent among purchasing professionals. This was further confirmed when analyzing the interviews and observations later. It could therefore be argued that a questionnaire seeking to explore the self-image on competencies of a professional group should be designed in a way that such implicit knowledge

does not remain undiscovered. The questionnaire design as presented in this study is an example of how this can be achieved.

When looking at the defined aims of questionnaire part C data collection, it can be concluded that the decision to expand the quantitative data collection through a likert scale part was reasonable. The competency information as collected from questionnaire part B was significantly enriched through part C. Through questionnaire part C, lots of new competency needs were identified and used for model development. Besides, the method revealed that even though DFS purchasing professionals seem to require a unique set of competencies, some of the shortlisted (literature review originated) competency attributes were confirmed as important for DFS purchasing professionals as well. This means that some of the competency information as collected from the literature review could be verified as adaptable for a DFS purchasing professionals' competency model, which further confirms the benefits of collecting preliminary competency information during a literature review. It can be concluded that the two questionnaire parts B and C complemented each other in collecting comprehensive quantitative competency information. Either of the two data sets is considered incomplete without the other. The combination of questionnaire part B and part C analysis provided a more complete picture of DFS purchasing professionals' self-image on competency needs.

As the data collection results so far only reflect purchasing professionals' self-image on competency needs, expert interviews were later conducted to collect data from different viewpoints. The questionnaire brought solid insights regarding purchasing competency needs for model building at DFS. However,

from the analysis of expert interviews, additional and highly specified purchasing activities and corresponding competency needs were identified, analyzed and processed in order to complement the developed model.

5.2.2.2 Expert Forum workshop 2

After analyzing the questionnaire data and combining the quantitative data from the different questionnaire parts, the Expert Forum served to further process the questionnaire results (4.2.2). Without further prioritization of the still extensive data basis, it would have been difficult to reach the goal to develop a model which is reasonably precise, easy to handle and manageable regarding the amount of competency information included. Also, it was intended to further benefit of the internal expert knowledge and to further substantiate the interim findings from the questionnaire phase. It can be concluded that using an Expert Forum as iterative instance for interim data processing again helped to reach the study objectives. It proved that choosing a participatory approach for model development was helpful for the study in hand.

5.2.2.3 Interviews

Additional competency information was synthesized from the interview transcripts, which were analyzed qualitatively. From 62 first level codes, three categories of codes were developed in a first step. Then, the text under the formed categories was analyzed for recurring themes in the extensive participant narratives. Nine themes were identified. From each theme, a number of purchasing activities, competency requirements and expectations

from purchasing management and customer perspective were identified. Finally, a matrix was set up which includes the identified purchasing activities and their corresponding purchasing competencies.

As it would not be reasonable to directly assign these additional competency needs to the purchasing activities identified in the questionnaire analysis, it was decided to keep them separated. Using them as additional source of competency information allows for individual assignment when *applying* the competency model, for example when defining a purchasing profile and compilation of activities and respective competency needs. The approach to use the view of purchasing customers and management and the competency information explored from it as components of a modular system takes into account and reflects the needs of those who might apply and use the competency model in future. The identification of advanced competency requirements for specific purchasing activities adds to the idea of developing a competency model which can be used as a modular system in terms of adding specific competency attributes to individual purchasing profiles or job groups. The additional competency information from the interview analysis can be added to the existing data as modular blocks to reasonably complement the defined competencies needed. In this way, it is possible to realize a competency model as a system that consists of basic competency attributes for certain activities which can be extended through additional modules of purchasing activities and corresponding competency attributes. With this modular system, competency requirements for different purposes, sets of activities and employees can be compiled (see paragraph 5.5).

From a methodological point of view, the following can be concluded. Even though the interviews were structured to identify competencies for different purchasing activities under various superordinate purchasing tasks, it turned out that many interviewees did not follow this strict breakdown and logic. Instead, they mixed all kinds of information on purchasing tasks, activities and competency needs in their narratives along with personal experiences, critique and suggestions. Here, the flexible and non-standardized interview approach as well as a sufficient amount of questions and interview time allowed for synthesizing a large amount of competency related information from the interview transcripts. Choosing a more standardized approach to conduct interviews with less interviewer freedom might therefore be less appropriate to identify competency information.

From analyzing the interview transcripts, it becomes apparent that the questionnaire data alone would not have been sufficient to identify the competency needs at DFS purchasing. Developing the competency model based on the questionnaire results only would have led to an incomplete and too subjective model. Vice versa, interview data alone would also not be sufficient for building a comprehensive model. The combination of quantitative questionnaire data and qualitative interview data supports the goal towards collecting a more complete dataset. Conducting interviews with customers and management proved to be a good approach when developing competency models. The need for diverse sets of data and the combination of different views and standpoints on competency needs made the model a more complete one in this case study. The decision to follow a mixed method

approach in a parallel research design turned out to be suitable to support reaching the study objectives.

However, it is interesting to notice that the questionnaire revealed more the generic competency requirements, whereas the interview results especially highlighted the need for various functional and subject specific competency needs. One might have expected that it would be the way around: purchasing professionals should know about all their competency needs, generic and functional and would focus on the specific, purchasing related competency needs that define their jobs and make their work challenging and demanding. Purchasing customers on the contrary demonstrated a much deeper understanding and reflection of purchasing activities and competency needs than expected by the researcher. Especially when considering that the appreciation of the purchasing function in general is a slow and sometimes conflictual process, it is a pleasant surprise that lots of attention and respect towards the purchasing function and necessary purchasing competencies was expressed through the interviews.

5.2.3 Phase 3: Model verification

After developing the competency model as described, it was verified through conducting participant observations. The idea was to explore whether there is a divergence between the model contents as developed from the self-image of purchasing professionals and actual purchasing professional behavior and application of competencies in business practice.

Summarized, it can be said that the observation method served well to verify the developed model. From 140 observed activities of purchasing professionals, 15 activity codes were developed and corresponding competency needs were identified. These findings were then compared to the self-image of purchasing professionals, which was explored earlier through the analysis of questionnaire data. Interestingly, only parts of the observation results matched those results gained through the questionnaire analysis. This means that for some reason, a number of observed purchasing activities and competencies had not been reported by the professionals through the questionnaires in the model development phase.

Through analyzing the observation field-notes and through reflecting on the observed purchasing activities, the applied competencies necessary to perform the identified activities were concluded. They were considered as important competencies and potential improvements for the developed competency model. However, it is interesting to note that many observed purchasing activities and applied competencies were not mentioned by purchasing professionals in the questionnaire phase. The question here is why are purchasing professionals performing a much broader variety of activities

and why do they apply many competencies they did not mention when asked through the questionnaire in the model development phase. The reasons for this will be discussed here.

One reason for the above phenomenon could be that purchasing professionals simply did not consider this information on activities and competency needs as important. Also, it might be possible that purchasing professionals simply forgot to mention them when filling out the questionnaire. Both above possibilities could be imagined for repetitive, administrative and standard activities, but probably not for such highly demanding and complex activities as those observed.

Another reason why competency needs remained unexplored in the questionnaire phase could be the existence of implicit participant knowledge.

Implicit knowledge on purchasing activities and competency needs

Throughout the case study, various indications for the existence of implicit participant knowledge surfaced in different study phases:

Analysis of questionnaire data. When preparing the quantitative analysis of questionnaire part B data, it became apparent that some study participants found it difficult to express competency needs in writing. This resulted in some very generic questionnaire statements like *expertise*, *skillful*, *experienced*, and *studied* which were excluded from the analysis (see 4.2.1.4). I argue that the above terms were chosen by the participants due to their inability to express and make explicit specific purchasing competency needs. They knew a purchasing professional must be skillful, but could not put in words what skills exactly are necessary.

Also, the fact that questionnaire part C analysis revealed new competency information could be an indication of implicit participant knowledge on purchasing competency needs. When comparing questionnaire part B and part C results, it becomes evident that some competency needs could only be explored when providing a catalogue of predefined answers to the purchasing professionals (likert scale). Some of these predefined competencies *were* rated important or very important by the purchasing professionals even though they were not mentioned in the free text diagram (unaided recall). It appears that the participants only realized the importance of these competencies when they saw them in the likert scale tables. They were part of the participant's implicit knowledge on competency needs and could only be revealed through the combination of questioning techniques (methods) in the questionnaire.

Analysis of interview data. When analyzing the interview data, it became apparent that purchasing customers and management had an extended view of purchasing activities and competency needs compared to the self-image of purchasing professionals. Lots of purchasing activities and corresponding competency needs were identified through the interviews which were not discovered through the questionnaire analysis at all. It could be argued that these additional competencies requested by purchasing customers and management were not mentioned by purchasing professionals because they were unable to put them in words, they did not come to their minds when being asked in the questionnaire, but belong to their implicit knowledge on own competency needs. This assumption appears to be true especially when considering the participant observation results (interview results match observation results).

Analysis of observation data. The existence of purchasing professionals' implicit knowledge on purchasing competencies was especially highlighted in the model verification phase and through the conduction of participant observations. Many observed purchasing activities and applied competencies were not reported as part of purchasing professionals' self-image as explored through the questionnaire. I argue that the reason why this additional information was not revealed through the questionnaires is the existence of implicit participant knowledge. When filling out the questionnaires, the participants obviously were unable to put certain information on their purchasing activities and competency needs into words because they were not aware of these and they did not come to their minds when thinking about the posed questions. I therefore conclude that when purchasing professionals frequently perform certain activities and apply specific competencies, but fail to make them explicit when being asked, implicit knowledge exists among them. As many new activities and competencies were demonstrated during observations, the observation results are a strong indication for implicit participant knowledge on purchasing activities and competency needs.

Implications for the developed competency model

This study and especially the observations revealed that DFS purchasing professionals have significant implicit knowledge about their purchasing activities and competency needs. The question was raised how this implicit knowledge should be considered in the developed competency model.

The author argues that the insights gained from observations should be added to the developed competency model. However, when comparing the implicit

knowledge on purchasing activities and competency needs as identified from the observations with the results of the expert interviews, an interesting match could be noticed. Obviously, the purchasing professionals' implicit knowledge on purchasing activities and competency needs largely corresponds to the information as analyzed from the expert interviews. In other words, purchasing customers and management expressed what purchasing professionals did not express or were not able to express. It is very interesting that those competencies which were only implicitly demonstrated by purchasing professionals during observations match those expected and therefore expressly stated by the customers and management.

It might be a coincidence that the identified implicit knowledge was made explicit by the interviewed experts and thus already found its way into the model. In case the interviews would not have brought such rich insights into the question of competency needs, the additional consideration of implicit knowledge gained from observation results *would* have been necessary in order to develop a more complete competency model. The question that raises here is whether the effect described was an exceptional case. From the author's point of view, it cannot be assumed that implicit participant knowledge is covered by other data sources in every case. It is therefore argued that observations as a method to reveal participant's implicit knowledge on competency needs should be part of a comprehensive competency modeling process. Even though for this case study, the model would not look very different even without conducting participant observations, they were nevertheless necessary to reveal and confirm the existence of implicit participant knowledge on purchasing competencies.

5.3 Study implications for theory

This study adds to the theory of competency modeling in the purchasing profession. One of its outcomes is a competency model for purchasing professionals at DFS, which is presented in paragraph 4.3.

The literature review has shown that only very few original research studies aiming at the development of competency models for purchasing professionals exist, especially in volatile environments like the ANSP business. This case study was conducted in an environment where very little is known about purchasing competency needs. Through useful combination of quantitative and qualitative methods the work in hand aimed at providing an example of good practice for industry specific purchasing competency modeling.

Transferability of study results

Sound *generalizability* of research findings requires data on representative populations, large scale quantitative data collection or experiments. Consequently, due to the nature and approach of the research in hand, generalizability of study results seems difficult. However, I argue that the study results might be *transferable*, which means application of study results to similar and selected situations or environments.

Barnes et al. (2012) confirm that whereas generalizability is almost impossible in case study research due to the lack of representativeness of the study population, case study results might be transferred to outside contexts (cases). The authors claim that due to the detailed reports of study methodology and results, transferability is most relevant to research involving qualitative methods and case studies. “*The detailed nature of the results, however, makes*

them ideal for transferability" (Barnes et al., 2012, p. 5). According to the authors, a case study's approach, methods, ideas, argumentation and results might be transferable to different contexts. Transferability of study results could be applied by readers of the study or those intending to make use of study results. Transferability can apply to most types of research and does not make broad claims, but involves making connections between study results and own experience in different, maybe comparable environments or cases (Barnes et al., 2012).

The results of this case might be transferable to purchasing departments of other ANSPs or organizations or state owned companies operating under similar conditions in the aerospace industry. The methodology applied could also be used as a template for industry specific competency studies in similar environments or industries under equal conditions. Besides, the developed research design could also be used to set up and verify competency models for different professional groups inside and outside of DFS.

Barnes et al. (2012) claim that researchers seeking to discuss transferability of study results should include a rich and detailed description of the study environment, the research approach and methodology as well as study design. This would enable the readers to compare and decide whether the above specifics match to their personal environment. "*If there are enough similarities between the two situations, readers may be able to infer that the results of the research would be the same or similar in their own situation*" (Barnes et al., 2012, p. 5). The extensive introduction of the setting and methodology and methods of this thesis, which the above authors call *thick description* take this idea into consideration.

As discussed earlier, Yin (2009) argues that in order to claim external validity of study findings, the study should be replicated in a second or third case. This could be achieved through further research as outlined in paragraph 5.7. The claim that my study results are transferable to certain contexts also corresponds to the statement of Rodriguez et al. (2002), who claim that developing competency models in *comparable companies* might be a waste of time and money.

Considering the above, I do not insist on transferability of my study results, but through the detailed report about my case study, I seek finding interested readers who might make informed decisions based on my writing and consider parts of it relevant and possibly transfer it when looking at their own situation.

Identification and use of implicit participant knowledge

The role of implicit knowledge and its implementation in competency models is rarely documented in literature. The author considers this as problematic as it is largely unknown how to deal with this important source of data or whether it is worth to be considered in the competency modeling process. As outlined above, strong indications for the existence of implicit knowledge on competency needs were found in various phases of the case study in hands.

I therefore argue that implicit participant knowledge needs to be identified and should be considered when developing competency models. The case study in hand has shown that participant observations are a suitable method to reveal the existence of such knowledge and it explored that implicit knowledge on purchasing professionals' competency needs exists in DFS purchasing department. Even though in this case study the implicit knowledge of

purchasing professionals was also covered by another data source, it can be concluded that model verification through observations was helpful to:

- confirm whether theoretical model contents are reflected by purchasing professional activities and applied competencies
- identify whether implicit knowledge on purchasing activities and competency needs exists among purchasing professionals
- explore additional competency needs

One conclusion from the observation results is that they are an effective method for model verification. Without observations, developed models potentially lack important information. This study revealed that different kinds of knowledge should be considered in the modeling process. Exploring the role of implicit knowledge and proposing ways to reveal it when identifying competencies contributes to the theory of competency modeling and knowledge management in company environments. When competency models are developed from scratch, the question for implicit participant knowledge on competency must be raised. The approach and study design proposed here are suitable to reveal this kind of knowledge and to support the development of more complete and sustainable competency models.

Multi-perspective data collection and participatory approach. As outlined earlier, the multi-perspective view and collection of diverse data sets added to model completeness and quality. The author argues that competency modeling without considering diverse stakeholder views on competency needs leads to fragmented results and sketchy models. A participatory approach to competency modeling as introduced in this study turned out to help improving data quality and to raise reliability of model contents. Also, convincing internal experts to participate in the model development process can be confirmed as

adding trust and confidence in the study purpose and might even facilitate model implementation and application in the future. Summarized, I argue that letting others participate in competency model development adds to more solid outcomes.

5.4 Study implications for business practice

From the study results, various implications for business practice can be deduced.

Model implementation at DFS purchasing department

As the research study reached its goals to develop and to verify a competency model for DFS purchasing professionals, model implementation would now allow taking advantage of the positive effects a competency model offers. After implementation at DFS purchasing department, the model could be applied to promote and extend the DFS competency based approach to HRM on a departmental level. The study results might also raise an internal discussion about developing models from scratch in other departments. Besides and as outlined above, study findings and methodology may even serve as example for other ANSPs seeking to identify purchasing competencies.

The research findings can contribute to the development and competency oriented (re-) organization of DFS purchasing department. The creation of in-depth knowledge about the special competency requirements on purchasing professionals can help executives to understand how to deploy staff more efficiently and what kind of professional training may be necessary. Ideally, the research findings will lead to an increased efficiency of purchasing and also

contribute to the ongoing process of positioning the purchasing function as a function with strategic impact in the organization.

The research results can help determining whether DFS purchasing professionals are prepared to meet the challenges of a dramatically changing business environment. Learning needs might be discovered and the grounds for an updated or changed personnel strategy can be laid. The competency model can assist to shape and substantiate the competency profiles of current and future DFS purchasing professionals. Employers have to be prepared for upcoming business and market challenges and provide attractive training programs (Scholz & Wolff, 2008). The study outcomes can inform the creation of such training programs for purchasing professionals specialized in the ANSP business.

Employee training

The development of internal training and development curricula for DFS / ANSP purchasing professionals based on the study results seems possible. DFS maintains an own infrastructure for staff training, but currently, the so called *DFS Academy* is mostly used for qualifying and training operational air traffic controllers and technical staff. This infrastructure could easily be used for the education, training and further development of purchasing professionals as well. This research project developed knowledge necessary to realize such plans. Findings about purchasing competency requirements could easily be transformed into a curriculum for purchasing professionals. Thus, a sustainable benefit for employee development as well as purchasing performance could be achieved. In a further step, common training curricula

for European ANSP Purchasing Professionals might be developed and introduced industry-wide.

Staffing at DFS purchasing department

Study results have shown the need for advanced technical competencies and knowledge of IT, ATC and CNS systems of purchasing professionals. However, only few purchasing professionals with technical background and profound competencies in such areas currently work at DFS purchasing department. One implication of the study results might therefore be to hire more staff with technical background and competencies for purchasing department. Hiring such staff would enable purchasing to talk on an eye level with customers in IT- and technical-departments. Especially when buying IT, ATC and CNS systems and services, such specialists could significantly improve purchasing service quality, raise customer satisfaction and contribute to better purchasing performance. They could also serve as bridge to traditional purchasing professionals and share their technical know-how with other purchasing staff. However, promoting training of purchasing professionals in technical disciplines according to the individual needs might also result in more technically competent buyers.

Study results also show that (advanced) legal competencies are essential for purchasing professionals at DFS. The question might therefore be raised why only one jurist is currently working at purchasing department. It could be argued that learning by doing is sometimes not sufficient to develop solid legal competencies and that purchasing management should hire more staff with more fundamental legal background or at least provide more professional

training in legal disciplines. Considering the fact that legal issues of all sorts more and more affect DFS purchasing professionals' daily business and project work, the study results in hand confirms the need to discuss the issue of legal skills in purchasing department.

Promoting organizational alignment according to material groups

Study results indicate that advanced competencies and knowledge in specific material groups, for example IT Hardware or services is needed. A first step in organizing DFS purchasing department according to general material groups (hardware and services) was implemented by purchasing management in 2013. Since then, more specialized purchasing teams concentrate on few defined material groups and services and build specific competencies for a more efficient and informed purchasing process. However, to further promote specialization of professional competencies and experience, more specific material groups could be identified and purchasing professionals could specialize to become material group experts with specific competencies and knowledge. This process could be justified by the study results in hand.

5.5 Competency model application example and discussion

The main objectives of this study were the development of a competency model (4.2) and verification of the developed model while exploring the role of implicit knowledge in competency model development (4.4). This paragraph provides an example and discussion of how the developed competency model could be applied at DFS purchasing department. It also discusses possible future activities and the general role that the developed model may play in the future work on purchasing competencies at DFS.

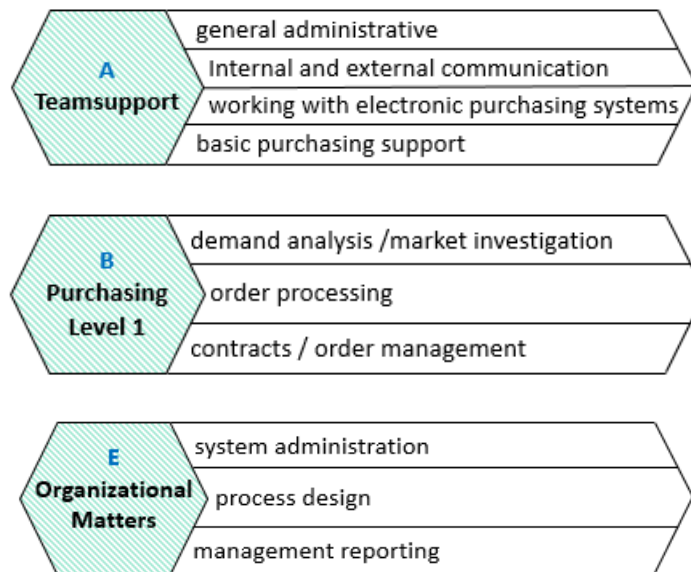
The following example demonstrates model application in the situation of an open job position at DFS purchasing department.

1. Due to the retirement of a professional at purchasing department, purchasing management decides to fill the gap and to hire a new employee. The DFS purchasing competency model is applied to support the process of needs assessment, personnel selection as well as later personnel management measures.
2. The actual main tasks of the leaving employee are “Teamsupport” and “Purchasing Level 1”. However, due to the expected future workload and personnel reorganization, purchasing management decides to expand the new employee’s tasks to the field of “Organizational Matters”. The three task areas of the new employee are highlighted in the figure below.



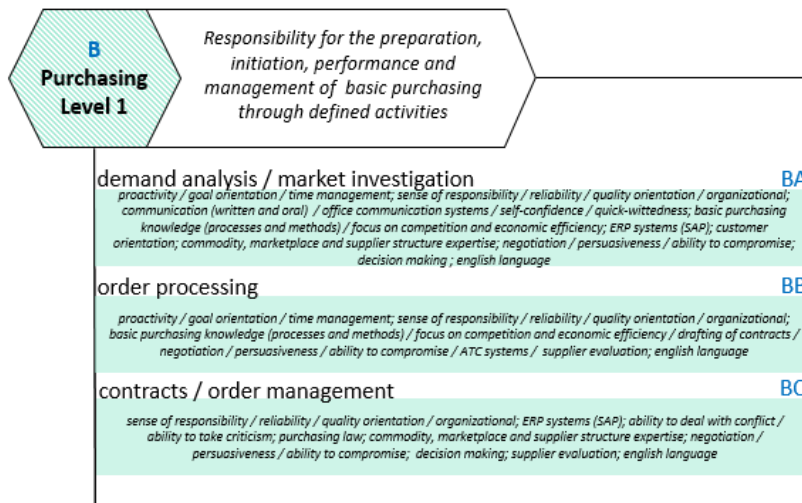
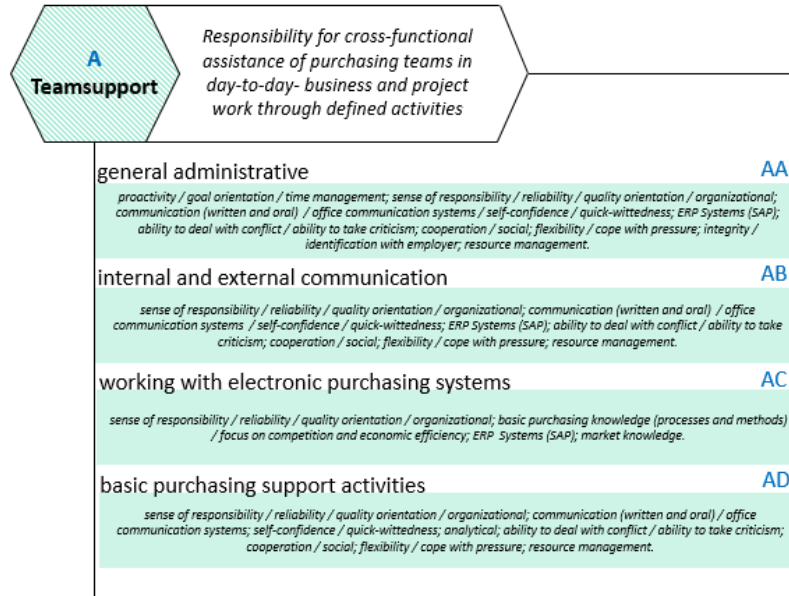
These task areas are combined to initially define the desired *job profile*, for example “*Specialist Buyer*”.

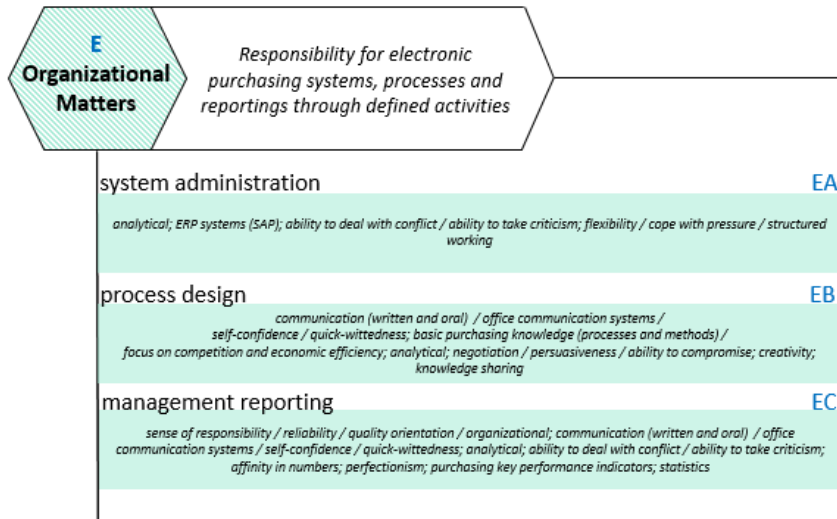
- Based on this initial selection of superordinate purchasing tasks, the activities of the Specialist Buyer are defined as follows:



- For each above purchasing activity, the corresponding competency needs are defined through the competency model. As competency needs were identified individually per defined purchasing activity, some

competencies may appear multiple times, which can underline the importance of such competencies.





5. In addition to the above allocation of standard tasks, individual activities and corresponding purchasing competencies, additional (advanced) purchasing activities can be added to the profile in order to reflect specific management or customer requirements.

The activities which go beyond those already included above can be added from the table as developed from the analysis of interview data. In this example, the Specialist Buyer will have to perform two additional activities, for example because he will be part of a certain specialized team in DFS purchasing department.

competencies	purchasing activities									
	controlling costs	providing marketplace and supplier information	sharing know-how/low knowledge	communicating purchasing value add	solving conflicts	providing commodity expertise	legal activities	process owner activities	teaching and networking activities	buying services
balance customer needs and expectations with purchasing strategy and goals				X						
conflict resolution and reach consensus			X	X				X	X	
jointly discuss and define evaluation criteria in tender process				X						
learn and further develop						X				
make clear and 'sell' purchasing's value add and strategy			X	X						
motivate and promote team cohesion								X		
analytic						X	X			
commodity, marketplace and supplier structure expertise	X	X			X					X
communication (discussion, argumentation, presentation, writing style)		X	X				X			
cost / benefit analysis (tender assessment)				X						
cost accounting / analysis (TCO)	X									
definition of goals and goal orientation								X		
design of contracts and other contractual documents						X				
financial accounting and controlling	X									
investment	X									
knowledge on process-driven company structures							X			
labour leasing										X
legal / compliance / contract design		X		X			X			
knowledge of market development and supplier base as well as on factors of influence (economy, politics, law ...)					X					
negotiation						X				
networking / relationship building	X									
patience and didactics		X								
persistence and assertiveness			X							
pricing	X									
proactive teambuilding and coordination								X		
process development and -mapping							X			
special legal knowledge in procurement (private) law						X				
project management							X			
special legal knowledge in public procurement law						X				
special legal knowledge for buying services (labour law and jurisdiction)										X
specialized knowledge 'purchasing and supply management'			X							
teaching (explaining, training, presentation)		X								
deeper technical commodity expertise (depending on customer department)					X	X				
understanding of DFS corporate structure and culture							X			
willingness and ability to share knowledge	X	X			X	X				X
willingness and ability to solve problems			X	X				X		

6. The additional activities assigned to this individual job profile are “buying services” and “process owner activities”. These additional activities require some specific competency needs, as the yellow markings in above table indicate.

buying services

- conflict resolution and reach consensus
- commodity, marketplace and supplier structure expertise
- labour leasing
- special legal knowledge for buying services (labour law and jurisdiction)

process owner activities

- analytic
- communication (discussion, argumentation, presentation, writing style)
- knowledge on process-driven company structures
- legal / compliance / contract design
- process development and –mapping
- project management
- understanding of DFS corporate structure and culture

7. With the purchasing activities and competency needs for the new position defined, all following human resources activities can now be aligned:

- a. Drafting a job advertisement based on the current and future competency requirements
- b. Conduct job-interviews and support the selection process
- c. Documentation of justifiable selection decision
- d. Design of an individual work contract and job description
- e. Personnel development measures, training, etc.
- f. Performance appraisal
- g. ...

Further discussion. This section discusses the aspects of *future modeling activities* and *the role of the developed model and its possible impact for future work on competencies* at DFS.

The competency model was developed based on data collected from late 2012 to 2014. Even though the author believes that the model contents remain valuable, it appears true that model contents should be checked for up-to-dateness on a regular basis. Currently, the developed competency model is an attempt and example of competency modeling at DFS purchasing department. As the modeling process is customized and developed as a best fit approach for the environment of DFS purchasing, it should be refined and further developed frequently to reflect the actual situation of purchasing department and the competency requirements of its workforce. The modeling process should be further developed and the model itself should be kept on an updated level. It is considered that this competency model needs to be kept current to be effective although the modeling process should remain applicable for some considerable time. Regarding the modeling process it might be a good idea to involve additional stakeholders in future revisions of the data collection process, for example external suppliers or DFS top management. Also, future questionnaire data collection and analysis should be paperless to save time and to increase transparency and reproducibility. For the process of regular model updates and modeling process revisions, the participatory approach as introduced here appears helpful as well. Possibly, an action research approach could be of benefit for future work with competencies.

Generally, the developed model as well as the modeling process might serve as blueprint for future competency modeling in other DFS departments. One

of the next steps might be to present the model and process to human resources department. As competency model development is normally not a purchasing activity, it seems necessary to further involve human resources and to offer the results gained from the case study in hand as basis for future work on employee competencies. Since a competency model was developed for one department now, one further step could be to *implement* the model at purchasing department. When implemented and tested successfully, the role of the model could then successively be developed from an example to become a more solid groundwork for competency based human resources management at DFS. The impact of the study outcomes are difficult to anticipate, but it would be considered a success if they trigger and influence the debate on competencies and competency modeling at DFS and further afield. They could facilitate future work on in-house competency modeling and might provide the groundwork for standardized competency identification and modeling measures. The possible impact of the model depends on achieving the goals of top management support, acceptance and trust and the willingness to further exploit the possible benefits of competency modeling in company environments. The author believes that this study can support reaching these goals.

5.6 Study limitations

Approach for model development. One limitation of this study is the fact that the methodology applied does not rigorously follow one of the traditional approaches for competency identification and model development as outlined in the literature review. Instead, elements were chosen and combined in a way that seemed suitable to answer the research questions. Hereby, my pragmatic attitude and philosophical standpoint are reflected. The various approaches to competency modeling available confirm that there is no universal best practice approach, but the methodology and methods chosen should support the study goals and be reasonable under the given study conditions and context.

Data quality. The quality of data used in this study is limited by participant rigor and might therefore be biased. This could especially be alleged in studies covering sensitive topics like employee competencies, where various reasons are imaginable why participants provide false data. However, in this study it was worked towards minimizing the possible negative effects of subjectivity and participant bias by creating trust among the study participants, by integrating diverse data sources, by considering the research problem from various stakeholder perspectives and through involving internal Experts (Expert Forum) as an element of iteration and an instance for quality assurance in the research process.

Qualitative data collected in the interview and observation phases was analyzed and interpreted by me as an insider and practitioner in the field and might therefore be shaped to my own vision of a competency model. Also, the process of coding and grouping of quantitative data underlies a certain

subjectivity. Different researchers might come to different coding results or interpretations of qualitative data. The latter was limited by the implementation of the Expert Forum, which served to confirm decisions made in the different research phases and to process collected data where necessary.

Time, budget and methods applied. This study is limited by the timeframe given for the doctoral programme and expectations from DFS purchasing management who partly funded the study. There were also budget limitations regarding tool use for data collection and analysis. Moreover, purchasing management asked to chose data collection methods that are not disturbing business too much.

Sample size. The study is limited by its sample size regarding qualitative data collection. 12 interviews and a limited number of observations were conducted. However, as the sample sizes were reasonably justified and participants were selected based on defined criteria, it is not believed that conducting more interviews or observations would have raised data quality or insights gained. Regarding the observations, it was expressly noticed and documented that saturation was reached after a certain number of observations conducted.

Generalizability. The case study in hand is limited to DFS Deutsche Flugsicherung GmbH. Results could therefore be criticized for their limitation to one company. The author argues that the study results and chosen approach could be transferable to other contexts (see 5.4). This, as outlined in the next paragraph, should be verified through further research. However, the single case design is justified in detail in paragraph 3.3.1.1.

Scope of study. This study is also limited by its scope. It seeks to develop and to verify a competency model, but it does not aim at implementing the developed model.

5.7 Future research

From the study findings, its limitations as well as the researcher's experiences and further research interests, the following suggestions for future research can be given:

- a. As indicated in the study limitations, this research study focused on model development and verification, but not on model implementation in the professional environment the research took place in. In order to take advantage of the developed competency model, it should be implemented and its effects on individual or group competency development, learning curves and (purchasing) customer satisfaction should be validated in a long-term study.
- b. Study results should be further verified in a broader scope to confirm the author's view that study results are transferable to comparable cases. Yin (2009) suggests study replication to reach external validity of study findings. As there are only few ANSPs, broadening the study scope would mean going international. This could be for example done through a multi-case study including all FABEC countries or even all European countries. Such expanded studies might reveal that international ANSP purchasing professionals need a different set of

competencies, or that some or all results from this study can be transferred to other research settings as well.

As one outcome of a larger scale study, the development of common (European) job profiles in ANSP purchasing would be possible. The creation of a typology of job titles for purchasing professionals in the ANSP business could further contribute to the body of theoretic knowledge as well as industry practice.

- c. More research should also be conducted on the aspect of implicit knowledge consideration in (purchasing) competency modeling. This study revealed that implicit knowledge on competency needs should be considered in the modeling process. However, it should be confirmed through further research that implicit knowledge is an important aspect to consider when conducting competency studies.
- d. Also, focusing the aspect of purchasing performance would be an interesting expansion of the study scope. The question whether individuals, purchasing teams or purchasing departments perform better after implementation of a competency model which is based on the study results in hand should be investigated through additional research.

5.8 Reflection of my doctoral journey (post viva)

This final paragraph serves to express some thought and reflection on selected aspects of my doctoral journey. It directly connects to paragraph 1.6, where I reported on my general motivation to undergo doctoral research.

When looking back at my research proposal from 2010, it is noticeable that - albeit being formulated quite sketchy and broad - the main ideas and aspects survived and formed the basis of what finally became the doctoral thesis in hand. Some few sentences from the proposal can be found in the thesis one-to-one, which is surprising for me when considering how often the thesis was critically read and reworded, revised and changed. This shows that the basic idea I developed five years ago was strong enough to keep me interested and busy over such a long timeframe. However, new ideas were added to the research plan over the time. The aspect of implicit knowledge for example was discussed during the extensive RD1 phase which I will address again later. Other plans like the conduction of a European multi-case study or the deeper focus on aspects like model acceptance and knowledge sharing were dropped. Over a timeframe of three years, the once very broad topic was focused to competency model development and selected aspects of special interest.

Now five years later and in post viva phase, I can confidently say that working on the topic of purchasing competencies was fruitful and the general (personal) goals I formulated earlier were achieved. These were a profound business practice contribution, the development of theoretical knowledge and the expansion of my experiences in academic writing.

The term *doctoral journey* that everybody kept using during the DBA induction and taught module phase appeared overstated and somehow glamorized to me. I believed that what I was about to do was of little difference to my previous studies, but this turned out to be wrong. Back then, I was not aware or even prepared for the many ups and downs, changes in direction, dead ends and paths I would need to explore over the next five years. An example for this and one of the biggest challenges of my doctoral journey was to identify my own position as a researcher and the many different directions I can chose for future research projects. The basic or purist research philosophies I initially discovered seemed to be theoretic and inflexible, two attributes a practitioner and professional in a company environment might want to avoid. To learn about alternatives, middle courses and compromises in philosophical thought, like pragmatism, was like discovering a way to escape from restrictions and felt like personal development of me as a researcher.

When preparing for the viva voce, I tried to change perspective and reflected on what I would ask a student as examiner and what I would answer as student. Among the first questions that came to my mind was: *Did your doctoral journey turn out as expected?* When being asked, I would have to say *yes and no*: Many things turned out as I hoped they would. First of all, I feel that I have learned a lot and I developed my own competencies, I gained knowledge of research philosophies, research approaches and tools, thesis writing, referencing, etc. Also and most importantly, I succeeded in finding a way to combine theoretical and practical aspects in one research project. I am confident that the study results are interesting and helpful for business practice

and also substantial enough to be publishable and that they can be of value for future researchers in the field of competency modeling.

However, some things did not turn out as expected. For example, the RD1 phase took much longer than planned and it was a real challenge, too. The harmless looking RD1 form turned out to become one of the main obstacles for proceeding from the planning and preparation phase to the data collection and analysis phase and caused me extra effort of more than three months. The main difficulty with RD1 was to bring everything to a point. For more than two years, I had collected hundreds of sources, developed numerous ideas and sketchy study plans and already started planning data collection and working on early texts for the thesis. But then, suddenly, I had to decide and formulate what exactly I wanted to do – which might sound easy, but was a real challenge for me as an unexperienced research student. I spent months in preparing my RD1 and working with the numerous comments from my supervisors and examiners. In this phase, my fellow student and friend Sascha left the programme, frustrated by his RD1 comments and burdened by the birth of his daughter and a job change. Now, I somehow felt alone and I recognized how important it was for me to discuss study progress, questions and plans with someone who is in the same situation, a student. I am happy and also a bit proud of the fact that, with the help of my supervisors, I succeeded in keeping on going forward and not losing sight of my main goal: finalizing my research project.

Today, I see my journey coming to an end and I am thinking about ways to build on what I have achieved. I would like to keep on working on the topic in

both ways, practically and in theory. After implementing the developed competency model at DFS purchasing, it might also be interesting to theoretically focus on model implementation in purchasing environments. I could expand what I called my “participatory approach” to an action research approach and maybe even take up earlier ideas and aspects of interests like the grade of acceptance of competency models within the company and how it can be measured or even influenced.

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Annexes

Annex 1 – Literature synthesis matrix

Annex 2 – Final shortlist of competency attributes

Annex 3 – Informed consent letter and declaration form

Annex 4 – Brain storming example definitions in Expert Forum 1 (pin boards)

Annex 5 – Questionnaire

Annex 6 – Interview guideline and questions

Annex 7 – Observation field note sheet

Annex 8 – Data collection and analysis overview chart

Annex 2

Final shortlist of competency attributes

generic attributes

- 1 ethical
- 2 integrity
- 3 identification with employer
- 4 motivation
- 5 judgment
- 6 communication
- 7 analytical thinking
- 8 learning / further develop
- 9 sharing knowledge
- 10 decision making
- 11 teamwork / cooperation
- 12 customer orientation
- 13 structured working
- 14 creativity
- 15 operational
- 16 convincability
- 17 criticism
- 18 resource management
- 19 cope with pressure
- 20 deal with conflict
- 21 goal orientation
- 22 thinking / acting economically
- 23 ability to change
- 24 quality orientation
- 25 problem solving
- 26 joined-up thinking
- 27 understand "the big picture"
- 28 self confidence
- 29 working independently
- 30 sense of responsibility
- 31 coordination
- 32 ability to compromise
- 33 flexibility
- 34 interpersonal
- 35 presentation
- 36 personell management

functional / professional attributes

- 1 materials (production)
- 2 processing technology
- 3 production systems
- 4 technical specifications
- 5 computers
- 6 atc / cns systems
- 7 e-procurement
- 8 materials logistics
- 9 purchasing of capital goods
- 10 purchasing of services
- 11 purchasing of inventory materials
- 12 purchasing strategy
- 13 mathematics
- 14 statistics
- 15 accounting
- 16 controlling
- 17 procurement / private law
- 18 contract design
- 19 public procurement law
- 20 price regulation law
- 21 default (delivery, payments...)
- 22 frame agreements
- 23 commercial dunning
- 24 supplier management
- 25 material group management
- 26 procurement marketing
- 27 needs analysis
- 28 key performance indicators
- 29 supplier evaluation
- 30 supplier audit
- 31 purchasing processes
- 32 material group knowledge
- 33 market knowledge
- 34 quality systems
- 35 negotiation
- 36 english language

green = initial shortlist (35 attributes)

purple = expanded shortlist

Annex 3
(translation)

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Case Study „Competency model development at DFS purchasing department“
Participant information on data collection and
INFORMED CONSENT

Copy for Mr. **Heinz Kohl, KE/T**

As part of my doctoral studies, a case study within the DFS purchasing department is to be conducted. Data will be collected from various sources and analyzed in order to attain defined study objectives.

Based on the research ethics guidelines of my supervising university (University of Gloucestershire), this form serves to inform all study participants about the activities of data collection and data processing. In case of study participation, this form also serves as an informed consent declaration.

The conditions under which data are to be collected are as follows:

1. Study participation is on a voluntary basis.
2. Study participation will be anonymous.
3. No information will be collected in regard to who participated in the study and who did not.
4. If individuals do not attend, the fact of non-attendance will not be recorded or regarded as negative.
5. Data collection and analysis intends to answer the defined research questions and for achieving the defined objectives of the case study only.
6. Should the combination of collected data allow for the identification of individual study participants, this information will be kept confidential and will not be taken into consideration when analyzing the data.
7. All data will be collected anonymously (questionnaire) or will be anonymized (interviews, Expert Forum) for data analysis.
8. All data will be collected and analyzed through Mr. Stefan Schwertner only.
9. There will be no disclosure of data.
10. All data collected will be kept only until the point the study results are submitted as a doctoral thesis to the University of Gloucestershire (UK) and the thesis is marked as “passed”.
11. Study participation can be interrupted or canceled at any time without statement of reasons. In this case, the collected data will not be used but deleted.

**Annex 3
(translation)**



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Invitation to study participation

I hereby invite you to participate in my case study. During the case study, data will be collected through various methods. The study can only be successful when sufficiently supported by study participants. I would be happy if you could support my study by participating in the following measures of data collection:

Data collection by questionnaire	<input checked="" type="checkbox"/>
Data collection by interview	<input type="checkbox"/>
Data collection by Expert Forum	<input checked="" type="checkbox"/>

Confirmation of having been informed concerning the case study

<i>I hereby confirm that I was informed regarding the case study through the following measures:</i>	
Concept paper (via eMail)	<input checked="" type="checkbox"/>
Information meeting	<input checked="" type="checkbox"/>
Others (please specify) _____	<input type="checkbox"/>

I agree to participate in the case study.

I confirm that I was sufficiently informed about the case study through the above measures and that I was given the chance to ask and clarify questions.

I am aware of the facts that my participation in this case study is voluntary and that participation can be interrupted and / or canceled at any time without statement of reasons, and that withdrawing from the study will not result in any negative consequences for me.

I understand that the data collected through this case study are recorded and stored safely in anonymous form and that the data is analyzed by Mr. Stefan Schwertner for the purpose of this case study.

I agree that interviews and group discussions in Expert Forum workshops will be audio recorded (if applicable).

Participant name

Date

Signature

Annex 5



Stefan Schwertner
Im Münchsgraben 44
61130 Nidderau

Dear Colleagues,

As I already informed you in our information meeting, a comprehensive data collection forms the central part of my case study which I currently perform within the scope of my doctoral thesis.

A detailed description of the research questions, study plan and process of data collection was already provided to you as "Concept Paper" prior to our meeting.

A large body of data will be collected through a questionnaire survey, which is attached hereto. The target population for the questionnaire is all DFS purchasing employees (excl. invoice accounting).

The project can only be successful if there is a high survey response rate. Completing the questionnaire will take about 30 minutes. I therefore kindly ask you again to participate in the survey and to fill out the attached questionnaire.

Please do not hesitate to contact me in case of any questions regarding the questionnaire or in case of comments, critique or ideas regarding the research project in general.

Thank you very much for your support.

Best regards

Stefan Schwertner

Stefan Schwertner
Im Münchsgraben 44
61130 Nidderau

A. General questions about job position, experience, vocational education and training

Part A of the questionnaire collects general and demographic participant data. The data collected includes information about the participant experience levels and job categories and forms the basis for grouping and identification of different target population perspectives.

The following page contains 5 questions (blue text).

- Please answer the questions by filling the corresponding fields ()
- For questions 1-3, please fill only 1 field per question.
- For questions 4-5, multiple answers per question are possible.

Please also provide additional information about the nature, discipline and contents of educational / vocational / professional education and training. In case the available space is not sufficient, please use the area below.

Space for additional information (questions 4 and 5).

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A. General questions about job position, experience, vocational education and training			
<i>In what position / job level do you work within DFS purchasing department?</i>			
1.	A. Basic level	<input type="radio"/>	
	B. Specialist level	<input type="radio"/>	
	C. Expert level	<input type="radio"/>	
	D. Advanced / consultant level (team coordinator)	<input type="radio"/>	
	E. Management level (executive)	<input type="radio"/>	
<i>How many years of professional experience at DFS purchasing dept. do you have (incl. previous organization)?</i>			
2.	A. 0-3 years	<input type="radio"/>	
	B. 4-6 years	<input type="radio"/>	
	C. 7-10 years	<input type="radio"/>	
	D. 11 - 20 years	<input type="radio"/>	
	E. More than 20 years	<input type="radio"/>	
<i>How many years of professional experience at other purchasing dept. do you have?</i>			
3.	A. 0 years	<input type="radio"/>	
	B. 1-6 years	<input type="radio"/>	
	C. 7-10 years	<input type="radio"/>	
	D. 11 - 20 years	<input type="radio"/>	
	E. More than 20 years	<input type="radio"/>	
<i>Please provide information on educational and vocational education</i>			
4.	A. School-leaving qualification	<input type="radio"/>	
	B. Vocational Training	<input type="radio"/>	Field:
	C. Higher Education Degree (Diplom / Bachelor)	<input type="radio"/>	Field:
	D. Higher Education Degree (Master)	<input type="radio"/>	Field:
	E. Other	<input type="radio"/>	Field:
<i>Please provide information on professional training activities</i>			
5.	A. I already participated in inhouse training activities	<input type="radio"/>	Focus / topic:
	A. I already participated in external training activities	<input type="radio"/>	Focus / topic:
	C. I obtained a certificate as part of continuing education	<input type="radio"/>	Focus / topic / title:
	D. I plan to participate in training activities within the next 12 months	<input type="radio"/>	Focus / topic:
	E. Self education (literature, trade shows, etc.)	<input type="radio"/>	Focus / topic:

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B. Tasks, activities and competencies of participants

Part B of the questionnaire deals with tasks, activities and competencies of the study participants. All data should be provided based on the own experience and related to the own and individual position in DFS purchasing department.

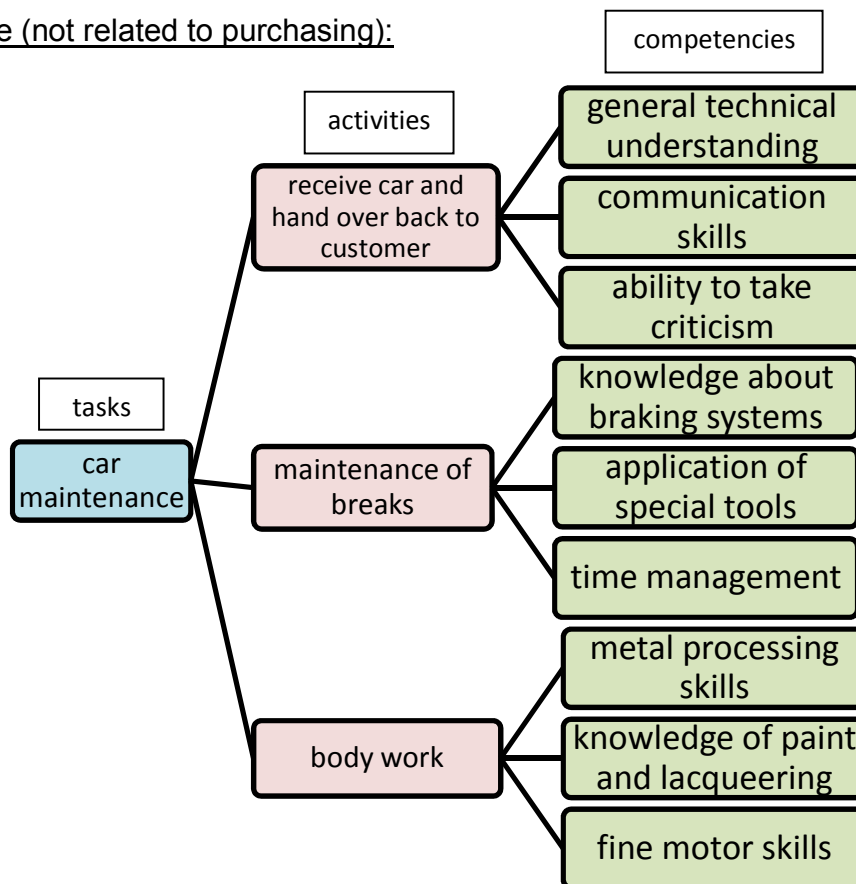
All information should be entered into a diagram. Please find an example of the diagramme on page 5.

Instructions:

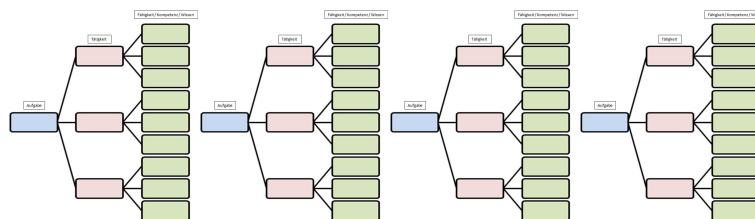
- Please specify the **most important tasks** you have to fulfill in DFS purchasing department (**blue fields**). Please note that the most important tasks are not necessarily the task you perform most frequently. Please rather choose those tasks whose fulfillment are of highest relevance to reach your positions goals.
- For each task, please then assign the three **most important activities** (**red fields**). Again, the most important activities are not necessarily the activities you perform most frequently. Please choose those activities you consider crucial to successfully perform the tasks.
- Finally, please choose the **most important competencies** necessary for the mentioned activities (**green fields**). Please note that the term “competencies” is not defined. You can therefore choose any competencies, skills, knowledge, behaviour, abilities, habits, personality traits, motives, values, etc –its up to the distinctive discretion of the participant.

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Example (not related to purchasing):



Please fill out the **4 diagrams** below. Activities and competencies can be mentioned multiple times. Therefore it is possible that for different tasks / activities, the same or similar activities / competencies can be assigned.



[The 4 diagrams were provided in full size in the questionnaire]

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C – Prioritization of attributes

Part C of the questionnaire presents a catalogue of different attributes related to purchasing professionals. This selection of *generic* and *subject specific* attributes was compiled from the results of

- a systematic literature review
- a competency workshop in DFS purchasing department
- an analysis of generic FABEC ANSP competency models
- an analysis of DFS internal documents (standard job descriptions, job advertisements)

Part C data collection aims at exploring the relevance / importance of the different attributes for the individual participants in their current position in DFS purchasing

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C		Prioritization of attributes				
I.	<i>Please rate the different attributes regarding their relevance / importance for your personal and current position in DFS purchasing department.</i>					
	Generic attributes	<i>extremely important</i>	<i>very important</i>	<i>moderately important</i>	<i>less important</i>	<i>unimportant</i>
1.	ethical understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	integrity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	identification with employer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	motivational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	judgment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	analytical thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	learning / further development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	sharing knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	decision-making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	teamwork / cooperation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	customer orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	structured working	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	cooperational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.	convincability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	ability to take criticism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.	resource management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.	cope with pressure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.	deal with conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.	goal orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22.	thinking and acting economically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23.	ability to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.	quality orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25.	problem solving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26.	joined-up thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27.	understand the "big picture"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28.	self-confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.	work independently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.	sense of responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31.	coordination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32.	compromise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33.	flexibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.	interpersonal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35.	presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36.	personnell management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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C		Prioritization of attributes				
II.		<i>Please rate the different attributes regarding their relevance / importance for your personal and current position in DFS purchasing department.</i>				
	Functional / professional attributes	<i>extremely important</i>	<i>very important</i>	<i>moderately important</i>	<i>less important</i>	<i>unimportant</i>
1.	materials (production)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	processing technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	technical specifications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	atc / cns systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	e-procurement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	materials logistics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	purchasing of capital goods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	purchasing of services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	purchasing of inventory materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	purchasing strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	mathematics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	statistics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	accounting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.	controlling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	procurement / private law	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.	contract design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.	public procurement law	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.	price regulation law	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.	default (delivery, payments...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22.	frame agreements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23.	commercial dunning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.	supplier management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25.	material group management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26.	procurement marketing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27.	needs analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28.	key performance indicators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.	supplier evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.	supplier audit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31.	purchasing processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32.	material group knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33.	market knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.	quality systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35.	negotiation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36.	english language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Guideline for the interviewer (translation)

Introduction and general information

- Thank you for your participation! Why did I choose YOU as interview partner?
- Duration of interview: approx. 30-45 minutes
- Type of interview: semi structured interview with mostly predefined questions, but flexible structure; discussions, counter questions and clarifications are possible during interview (why are semi structured interviews favored? alternatives?)
- Documentation: audio recording for later transcription and qualitative analysis
- Participants remain anonymous
- Refer to informed consent form

Study Background

- Case study at DFS purchasing department
- Study objective 1: To develop a competency model for DFS purchasing professionals; Study objective 2: To verify the developed model and to explore the role of implicit knowledge of purchasing professionals on purchasing competency needs
- Who will be interviewed and why (various perspectives, stakeholders...)
- Timeframe for interviews: February 18, 2013 – March 01, 2013
- Amount of interviews: 12

Note: This case study was not initiated by DFS general management or purchasing management. All data will be collected in coordination with purchasing management and the study results will flow into the doctoral thesis of Mr. Stefan Schwertner. However, the study results might serve as basis for future work with purchasing competencies at DFS purchasing department or DFS company.

Why conduct interviews?

- Part of data collection aiming at development of competency model
- Data collection from customer and management perspective
- Explain pros and cons of interviews / interviews vs. additional questionnaire

What are we going to talk about (in general)?

- Current and future demands and challenges that might impact purchasing department
- General function, tasks, challenges of purchasing department and purchasing professionals
- Expectations / requirements on purchasing professionals (competencies, skills, knowledge, behaviour, abilities, habits, personality traits, motives, values, etc.)
- Challenges / changes (technical, organizational, legal ...) in customer departments (short- and medium-term)
- Changed / expanded requirements on purchasing department
- Competency models in general (contents, structure, development, acceptance...)

Part 1 – Status quo

Information for interviewee

- a. The questions from part 1 cover the status quo, so please refer to the actual situation when answering the interview questions
- b. Please try to distinguish between function, tasks, activities and competency needs of purchasing when answering the interview questions (explain)

→ What is the **function** of purchasing department at DFS?

Note: This is about the superordinate corporate function (explain), not yet about tasks, activities or competency needs.

→ What **tasks** does purchasing department manage for you?

(for what tasks do you need purchasing department's support? e.g. sourcing suppliers)

Note: This is about superordinate tasks (responsibilities; explain), not yet about purchasing activities or competency needs)

→ In your cooperation with the purchasing department: What **activities** do you expect from purchasing professionals?

(What is your buyer actually doing for you / what are his activities to support you?)

→ What **competencies** are needed by purchasing professionals to successfully perform these activities??

(Term competency not defined yet / can be: competencies, skills, knowledge, behaviour, abilities, habits, personality traits, motives, values, etc.)

→ What are the **most important** competencies needed by purchasing professionals for these activities?

notes

Part 2 – Desired situation

Information for interviewee

Part 1 was about the status quo – now I would like to talk about the desired situation, the ideal world (how it should be from your point of view)

- What additional **function** should purchasing department should have?
(How do you imagine the ideal purchasing function?)
- What should be the purchasing department's **tasks**?
(For what tasks would you like to have purchasing's support?)
- What additional purchasing **activities** would bring you benefit?
- Do you consider purchasing as a **competent** service provider?
(why / why not?)
- What **additional competencies** should purchasing department / professionals have / develop / to fulfil the tasks and to better perform the desired activities?

notes

Part 3 – Future view

- What will / might be the future **technical / organizational changes** / evolutions in your area of business and how might they influence your department?
(What will be your future focus / will you have to change / develop?)
- How will / might the future **market development** affect your area of business and how might it influence your department?
- How will / might the future **political / legislative changes** affect your area of business and how might it influence your department?
- What are the short-term / mid-term **challenges** for your department?
- Which of the above circumstances will / might affect **the demands and expectations** you have towards the purchasing department and purchasing professionals?
- What are your future demands / expectations regarding new / updated **purchasing related competencies** / skill set
- Which **competencies** will be essential for **future purchasing** professionals?

notes

Part 4 – Competency model in general

- How would you rate usability and benefits of a **context specific and functional competency model** compared to a generic competency model?
(Explain difference and terms, refer to actual generic DFS model)
- A competency model can only be of benefit for an organization when it is **accepted and used** by the various stakeholders.
 - How could model acceptance be increased? What does the model need to become accepted and used?
 - For which purposes could the model be used?
- How should a **competency model** be developed and structured?
(Process, involved persons, methods, modular system ...)

notes

Annex 7

Date:	Event:	
Observer: Stefan Schwertner	Duration:	Sheet 1 of

facts observed (objective)

activities performed



competencies applied / interpretation / implications

Annex 8

Data Collection and Analysis Overview Chart

