The Organization of Strategic Purchasing

Case studies of formal and informal integration

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CASE STUDIES OF FORMAL AND INFORMAL INTEGRATION

BY
NINA LIDEGAARD

DISSERTATION SUBMITTED 2016

AALBORG UNIVERSITY
DENMARK

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INDUSTRIENS FOND FREMMER DANSK KONKURRENCEEVNE
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Dissertation submitted

CV

Nina Lidegaard has studied Global Business Engineering (BSc.) and International Technology Management (MSc.) at Center for Industrial Production, Aalborg University, Denmark.

Her background is therefore within the field of operations management and management engineering. Building on this knowledge foundation, Nina initiated her PhD study with the Sourcing Excellence research project founded by The Danish Industrial Foundation and hosted by Center for Industrial Production, Aalborg University, Denmark.

Her PhD research focuses on the organization and integration of strategic purchasing. Within organization the primary focus is on utilizing cross-functional sourcing teams, while integration is addressed through the various integration mechanisms implemented in the organization. Other research interests falls within the fields of process organization, integration and process optimization primarily within manufacturing industries.

Nina completed her PhD study in the period from October 2012 to May 2016.

ENGLISH SUMMARY

Strategic purchasing is emerging as an important research topic within PSM. Over the past decades, the increased importance of purchasing has led to the organization of strategic purchasing receiving increasing attention. The challenge is that both academics and practitioners have expressed frustrations with organizing for strategic purchasing. Especially, the implementation of cross-functional purchasing teams is often challenged, as there is consensus in the PSM literature on the usefulness of teams, but little practical evidence of how these teams are implemented successfully in practice. Thus, there is friction between the empirical experiences and the research within the field. This doctoral thesis aims at exploring the concept of purchasing organization. Focus is on cross-functional teams and integration, especially on the concepts of formal and informal integration mechanisms. The following three research problems are addressed throughout this paper based thesis:

- What are the characteristics of an effective or ineffective purchasing organization?

- How do various characteristics of cross-functional purchasing teams contribute to team performance?

- How do different formal and informal integration mechanisms affect overall integration between purchasing and other purchasing relevant functions?

The theoretical background of this thesis is purchasing theory, organization theory and the concept of cohesion from social psychology. Integration (and inherently differentiation) is a focal theoretical concept in the thesis. Furthermore, a contingency perspective is applied. This entails that the basic assumption underlying the research is that the appropriate organization is dependent on the goodness of fit between external, contingency factors and the chosen organizational design features. Hence, the more effective organization emerges if a good fit is created. In line herewith, it is argued that the appropriate level of integration should match the level of differentiation present in a given situation.

The empirical basis for this thesis is three case studies conducted in Danish companies all operating within project-based industries. Data was collected qualitatively through semi-structured interviews with managers as well as employees from multiple departments. Thereby, the research builds not only on a purchasing perspective but includes other departments' views and interpretation of the purchasing task. A qualitative research design was chosen as it is not only

appropriate for addressing the *how* questions framed in this thesis. Applying a qualitative research design also allowed the uncovering of perceptions and understandings of the respondents. Thereby, it provided the researcher with insights into e.g. the quality of implementation and informal aspects related to integration.

The theoretical findings and contributions to PSM literature are related to the approach adopted when incorporating constructs into the PSM literature. The concept of integration is widely applied in PSM; however, the counterpart of differentiation is not as popular. Hence, PSM tends to view integration as a goal to be achieved regardless of the level of differentiation within the organization. This approach entails that the concept of integration is, to an extent, removed from its original context. Thus, the use of integration within the PSM field is not completely in line with the original concept of integration presented in organization theory.

Furthermore, when addressing integration, it is more often than not presumed that implementing an integration mechanism will automatically increase the overall integration level. Empirical studies in this thesis questions this logic. Rather, it is argued that the quality of implementation of any given integration mechanism needs to be accounted for when assessing the overall integration level.

Finally, both formal and informal integration mechanisms should be assessed when addressing the overall integration level. The empirical studies presented in this thesis suggest that informal integration mechanisms not authorized by managers impact the overall integration level. Looking into the behavior of employees is presented as an approach to evaluating the presence of informal integration mechanisms, as well as evaluating the quality of implementation of the officially promoted integration mechanisms.

Managerial implications, thus, include recommendations that managers incorporate the concept of informal integration when working with their organizations. To a higher extent than today, managers have to include how the behavior of the employees impacts the overall level of integration. Hence, informal integration should be evaluated in order to be either utilized or made obsolete through implementation of other procedures.

DANSK RESUME

Strategisk indkøb er i dag et vigtigt emne indenfor indkøbs- og forsyningskædelitteratur. Det øgede fokus på indkøbs tiltagende vigtighed har i løbet af de forrige årtier resulteret i, at organisering af strategisk indkøb er kommet i søgelyset. Det står imidlertid klart, at både akademikere såvel som praktikere er frustrerede over den manglende succes inden for området. Specielt implementeringen af tværfunktionelle indkøbsteams er ofte en udfordring. På trods heraf er der en generel konsensus inden for indkøbs- og forsyningskædelitteraturen omkring brugbarheden af disse teams. Der findes dog ingen konsekvent empirisk bevis for, hvordan sådanne teams implementeres. Denne Ph.d.-afhandling har til formål at udforske og udvide viden omkring organisering af indkøb. Fokus er tværfunktionelle teams og integration. Specielt er fokus på formellem og uformelle integrationsmekanismer.

De følgende forskningsspørgsmål indgår i afhandlingen:

- Hvad karakteriserer henholdsvis en effektiv eller ineffektiv indkøbsorganisation?

- Hvordan bidrager forskellige karakteristika ved tværfunktionelle teams til teamets præstation?

- Hvordan påvirker forskellige formelle og uformelle integrations mekanismer den overordnede integration opnået imellem indkøb og andre relevante funktioner?

Den teoretiske baggrund for afhandlingen er hhv. indkøbsteori, organisationsteori samt begrebet "cohesion", der er lånt fra social psykologien. Integration (og derved også differentiering) er et centralt begreb i afhandlingen. Ydermere, benyttes grundtankerne fra contingency theory, hvilket betyder, at der er en grundlæggende antagelse om, at den rette organisationsstruktur designes således, at den stemmer overens med de eksterne forhold som indkøbsfunktionen opererer indenfor. En effektiv organisationsstruktur er således én, hvor der er god overensstemmelse imellem de for processen eksterne krav og indkøbsprocessens karakteristika. På samme måde antages det ligeledes i afhandlingen, at graden af integration skal være i overensstemmelse med graden af differentiering.

Afhandlingens konklusioner bygger på tre case studier af danske projektbaserede virksomheder. Kvalitative data blev indsamlet igennem semi-strukturerede interviews med ledere såvel som ansatte fra forskellige afdelinger i virksomhederne. Dermed bygger konklusionerne på et bredt organisatorisk

fundament, hvor ikke kun indkøbsfunktionens perspektiv er medtaget. En kvalitativ tilgang blev valgt, da den er god til at besvare de "hvordan"-spørgsmål, som stilles i denne afhandling. Desuden giver den kvalitative tilgang mulighed for at høre respondenters mening om og forståelse af emnet. Dermed opnås den indsigt der er nødvendig for at kunne konkludere noget om hhv. kvaliteten af implementering af integrationsmekanismer samt uformelle aspekter af integration.

Afhandlingen bidrager med indsigt i, hvordan indkøbslitteraturen i fremtiden bør være opmærksom på, hvordan elementer fra andre teoretiske felter inkorporeres. For eksempel er integration et flittigt benyttet koncept indenfor indkøbslitteratur. Alligevel opleves det sjældent, at "differentiering" er nævnt indenfor indkøbslitteraturen på trods af, at de to koncepter er tæt knyttet i deres oprindelige kontekst. Derved synes det, at indkøbslitteraturen til dels fjerner integration fra den oprindelige kontekst. Desuden har indkøbslitteraturen en tendens til at antage, at integration er noget positivt, som man bør stræbe efter. Jf. den oprindelige definition af integration, så er integration kun at stræbe efter, hvis det anvendes som modsvar på høj differentiering.

I indkøbslitteraturen antages det desuden ofte, at man opnår en højere grad af integration, når integrationsmekanismer implementeres. De empiriske studier i denne afhandling viser, at dette ikke altid er tilfældet. Man bør derfor se på kvaliteten af integrationsmekanismers implementering, da man derved bedre kan afgøre i hvilken grad de reelt bidrager til det samlede integrationsniveau.

Altså bør både formelle og uformelle integrationsmekanismer inddrages, når det overordnede integrationsniveau skal bedømmes, da de empiriske resultater i afhandlingen viser, at medarbejdere ikke altid benytter de formelle integrationsmekanismer efter hensigten. I andre tilfælde implementerer de på eget initiativ uformelle integrationsmekanismer. Derfor bør såvel formelle som uformelle integrationsmekanismer medtages i evalueringen af den samlede integration.

Baseret på ovenstående gives følgende råd til ledere indenfor området: Disse (mellem)ledere bør i fremtiden inddrage uformelle integrationsmekanismer i deres vurdering af graden af integration i deres organisationer. Dette vil sikre, at de fremadrettet får et mere reelt billede af integration. Desuden vil det give muligheden for, at disse ledere kan adressere den uformelle integration enten ved at lade den forblive eller ved at erstatte med formelle tiltag.

A PAPER BASED THESIS

The thesis is based on the scientific papers listed below. Parts of the papers are used directly or indirectly in the extended summary of the thesis. As part of the assessment of the thesis, co-author statements have been made available to the assessment committee and are also available at the Faculty. The five papers are made available to the assessment committee.

The following five papers are included in the dissertation:

Paper 1:   Lidegaard, N., Boer, B. and Møller, M.M. (2015), "Organising purchasing and (strategic) sourcing: towards a typological theory". International journal of Technology and Intelligence Planning, vol. 10, nr. 3-4.

Paper 2:   Lidegaard, N., Møller, M.M. and Ellegaard, C. (2013), "Effectiveness of sourcing teams". Working paper presented at the 20th International Annual EurOMA Conference Dublin, Ireland.

Paper 3:   Lidegaard, N., Ellegaard, C. and Møller, M.M. (2015), "Sourcing teams and interdepartmental integration". Working paper presented at the 31st Annual IMP Conference, Kolding, Denmark

Paper 4:   Lidegaard, N. (2015) "The cohesiveness of sourcing teams", Working paper presented at the 24th Annual IPSERA Conference, Amsterdam, The Netherlands.

Paper 5:   Lidegaard, N., Ellegaard, C. and Møller, M.M. (2016), "Coping with differentiation in project manufacturing organizations: What managers do when formal integration is not working". Submitted to and in review process with International Journal of Operations and Production Management.

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To the managers and employees participating in the case studies, I would like to say; thank you for entrusting me with your stories and for engaging so actively in the interviews.

Last but not least, my gratitude is extended to my partner Brian and my family for ensuring that parts of the past years have been devoted to thoughts not related to the PhD – in essence, thank you for helping to keep me sane. And to our baby girl, you haven't made finishing this PhD thesis any easier. I am sure this is not the last challenge you have in store for us!

Best,
Nina

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CHAPTER 1. INTRODUCTION

"The authors believe the time has arrived for purchasing researchers to reduce their emphasis on documenting purchasing's lack of a strategic reputation within the firm and instead to start investigating factors related to enhancing that reputation."
(Goebel et al. 2003, p.12)

It is not unfounded to argue that the importance of purchasing has increased over the past decades (Ellram & Carr 1994; Carter et al. 2000; Mol 2003), as the business environment has changed towards an increased focus on e.g. outsourcing and, thus, purchasing of goods and services from external suppliers. Carter et al. (2000) forecasted that the importance of strategic supply initiatives would increase over a 10-year period. Similar proposition was formulated by Carter and Narasimhan (1995), who argued that purchasing could no longer be viewed as infrastructure because the strategic reach of the function would increase in the future. The recent trends of outsourcing activities as well as involving suppliers in value-adding initiatives have been mentioned as promoters of the increased importance and, thus, strategic relevance of purchasing (Mol 2003). Hence, the recognition of purchasing's contribution to firm performance has risen (Cousins et al. 2006; Zsidisin et al. 2007). In fact, integration across the entire supply chain has been predicted to receive growing attention in the future (Zhao et al. 2008). Mol (2003) argued that purchasing can be a source for sustainable competitive advantage, as not only internal resources but also the way these resources interact externally as well as interlink with and support internal and external stakeholders can contribute to creating a competitive advantage (Watts et al. 1995; Faes et al. 2000).

Purchasing has the potential of becoming strategic in the proper situational setting; hence, obtaining strategic influence does not emerge out of nothing. Rather, purchasing needs to evolve into the strategic role (Reck & Long 1988). This notion of evolution is also adopted by multiple frameworks (e.g. Reck & Long 1988; Freeman & Cavinato 1992; Pearson et al. 1996; Cousins et al. 2006) arguing that purchasing must evolve and mature into a strategic position. Strategic purchasing is viewed as the most evolved maturity stage of purchasing. It is something to aspire towards, which indicates that it is not necessarily something to be achieved easily. Applying an evolutionary perspective entails that actions can be taken to elevate the purchasing function from one stage to the next. Hence, the strategic influence of purchasing is not a constant – it is an ever-changing condition; and achieving

strategic status is not a guarantee. Even if strategic status is achieved, it can be lost again if the situational characteristics change.

With the evolution into a strategic contributor, purchasing has become a "*...a cross-functional process, aimed at managing, developing and integrating with supplier capabilities to achieve a competitive advantage*" (Axelsson et al. 2005, p. 7). Carr and Smeltzer (1997) operationalize a definition of strategic sourcing as purchasing having a formal long-range plan addressing which commodities and services to be bought. This plan should be continuously evaluated according to changes in the company's strategy (Carr & Smeltzer 1997; Carr & Smeltzer 1999b). Hence, strategic purchasing is a range of decisions affecting company performance made by purchasing, but based on cross-functional perspectives. Where operational purchasing is often associated with tasks such as order placement; then strategic purchasing is concerned with e.g. identifying suppliers and maintaining relationships with such suppliers. Strategic purchasing, thus, has the role of brokering between internal and external relationships (Cox 1996) as well as the role of identifying and developing unknown suppliers, enclosing known suppliers and buying in a hard-to-imitate manner (Ramsay 2001). Hence, the tasks of purchasing involve bridging the complexities associated with internal as well as external stakeholders.

1.1. COMPLEXITY OF (STRATEGIC) PURCHASING

Purchasing has become a core participant in and promoter of an increasingly complex set of tasks, which require inputs from multiple stakeholders. Purchasing is no-longer an isolated call-off function; but an active player in integrating across corporate functions. Purchasing strategy becomes a concept necessary to include and address at multiple levels in the company (Hesping & Schiele 2015). Thus, when discussing strategic purchasing, there is a significant focus on integrating the purchasing function with other departments (Van Weele & Van Raaij 2014). Sustainable competitive advantage is argued to emerge through the integration of purchasing and other departments e.g. operations management, logistics, and marketing (Zsidisin et al. 2007). While traditional operational purchasing activities are mentioned as e.g. selecting, negotiating with, and ordering from suppliers; activities focusing on savings and consequently improving the overall company performance through reducing the cost of the purchased commodities. Strategic purchasing extends beyond this and includes activities like ensuring external involvement in innovation, supplier portfolio management as well as supplier development, and finally, development, implementation and evaluation of sourcing strategy (Carr & Smeltzer 1999b). Since strategic sourcing covers such a wide range of activities, it is only natural that purchasing initiatives can contribute to overall company performance in multiple ways. More specifically the purchasing function can add value and increase overall company performance through a)

ensuring that money is spent in a proper manner, b) improving the quality of the purchased goods and/or c) saving both time and money (Bals et al. 2009).

This thesis focuses purely within the focal company; and the internal mechanisms deployed to conduct purchasing tasks are in focus. Hence, externally focused supplier-relations etc. are not included in the scope of the thesis. Naturally, the external relations as well as changes in external, environmental factors will – and should – impact the integration and coordination mechanisms deployed internally between purchasing and other relevant functions. The relation between internal and external integration is, thus, acknowledged in this research. This thesis, however, addresses internal elements of organizational design, and how the internal interplay and coordination can influence the success of an organizational structure.

1.2. RESEARCH THEMES IN PSM

The multiple effects of the new elaborated role of purchasing outlined above have been addressed in research and purchasing and supply management (PSM) literature. The following section presents a brief overview of the most critical present and future research themes described by review articles in PSM. The purpose of this overview is primarily to illustrate that arguing the importance of purchasing organization is well-founded in current PSM research. PSM organization is one of the most frequent mentioned in PSM literature – both in terms of current research and proposed future research.

Research within the field of PSM is growing. Take, for instance, the annual IPSERA conferences focusing on purchasing, which originated as a small-scale event in 1992; 20 years later it has advanced into an international recognized PSM conference (Rozemeijer et al. 2012). This evolution may very well illustrate the journey of the PSM field from being reputed as operational to being viewed by a growing number of researchers as strategic (Rozemeijer et al. 2012; Zsidisin et al. 2007). As a consequence, there is a need for further research into configurations of the purchasing function within organizations (Cousins et al. 2006). In conjunction herewith, the number of articles on PSM related topics published from 2002 to 2010 has increased by 163 % (Spina et al. 2013). Similar results were presented by Mol and Wynstra (2006), who found that in the five-year period in-between 1999-2004 the amount of annual articles on PSM published in the investigated journals grew by approx. 50%. Hence, the field is growing and it has received increased attention in recent decades. More interesting than the growth of the field are perhaps the topics and issues addressed within PSM. The origins of past research may suggest future directions to be uncovered. Therefore an overview of papers concerned with current research topics as well as future research within PSM is outlined in Table 1.

Table 1: Topics for further research within PSM research.

	PSM organization	Sourcing teams	PSM strategy & corporate strategy	Supplier relations and supply base management	Technology to aid purchasing
Carter & Narasimhan (1995)	●	●		●	●
Carter et al. (2000)	(●)		●	●	●
Das & Handfield (1997)	●		●	●	
Glock & Hochrein (2011)	●				
Rozemeijer et al. (2012)	(●)	(●)	(●)	(●)	
Schneider & Wallenburg (2013)	●		●	●	
Spina et al. (2013)	●		(●)	(●)	
Wynstra (2010)	●		●	●	●
Zheng et al. (2007)	●	●	●	●	

Note: The symbol (●) indicates that the topic is not mentioned explicitly in the review papers, but deduced from the findings of the papers.

Due to the broad scope of purchasing's interaction with internal as well as external stakeholders; there are multiple links, interdependencies and alignment potentials to be researched and uncovered (Horn et al. 2014). Wynstra (2010) lists the top five research topics across 351 PSM articles. Three of these topics are related to strategic elements of purchasing: *supply base management*, *PSM and corporate strategy* and *PSM organization*. Wynstra (2010) has 'PSM organization' as one of the top three most addressed topics within PSM research. Glock and Hochrein (2011) also identify a variety of topics for future research within purchasing organization. Summarized in an overall research field denoted *Structural characteristics and determinants*, the following four research gaps are listed: a) analyze inconsistent results between contextual variables and the structure of the purchasing function, b) study further contextual variables in purchasing research, c) discuss the structure of the purchasing organization in light of its interaction with other functions, and finally d) identify additional contingency relationships to further our understanding of which situational factors influence the purchasing

organization (Glock & Hochrein 2011). Furthermore, a literature study by Mol and Wynstra (2006) found *purchasing and supply organization* to be the third most researched topic following *supplier relations* and *supply chain management*. Referring to the overview of articles presented in Table 1, purchasing organization is confirmed to be a frequent researched topic within the scope of PSM research. In line herewith, *Purchasing organization, teams and internal relationships* is the category with the second most publications within The Journal of Supply Chain Management (Carter & Ellram 2003). A reason for *organization* receiving such extensive attention may be that the topic covers a wide range of different approaches such as e.g. organizational structure, governance, debate between centralization and decentralization, cross-functional perspectives and teams (Wynstra & Knight 2004). Organization also covers e.g. formal elements such as technology and structural elements and informal people-related elements (Schneider & Wallenburg 2013). Organizing for purchasing is, thus, a matter of coordinating and integrating across various functions involved in the sourcing task. Although the focus of this thesis is specified as the internal organization of the purchasing function, which is a fairly well-covered topic within PSM, suggestions for future research reveal that there are still numerous topics to be addressed within this specific field. This doctoral thesis aims at uncovering further insights related to purchasing organization and achieving internal integration.

1.2.1. INTEGRATION AND ORGANIZATION

Future PSM organizations will become even more complex than today (Rozemeijer et al. 2012). As a result, purchasing professionals will be demanded to possess a broader spectrum of skills and knowledge (Rozemeijer et al. 2012). More specifically, purchasing professionals are anticipated to handle the tasks of creating networks with internal stakeholders, suppliers, and customers to mobilize activities in support of the overall business objectives (Rozemeijer et al. 2012). Purchasing's strategic impact is much dependent on aligning purchasing's goals with company goals as well as the objectives of other functions and suppliers (Carr & Smeltzer 1997). Purchasing needs not only to link its functional goals with overall company goals, it also need to actively integrate with other functions, as well as create the proper atmosphere (Carter & Narasimhan 1996) in order to fulfill the assigned responsibilities and effectively compete in the marketplace (Watts et al. 1995). As communication, coordination and integration are two-way streets, the purchasers' mental state is worth addressing, as their mental pictures of themselves need to evolve from being an independent agent towards being a team player in the company (Watts et al. 1995). Purchasers need to perceive themselves as contributing with a strategic and value-adding input to the company strategy in order to actually do so in practice (Goebel et al. 2003).

Hence, there are numerous different effects of the increasing complexity of the purchasing task related to a need for integration, for instance: cross-functional

teamwork (Rozemeijer et al. 2012), contribution to organizational strategy, organization and purchasing employees (Wynstra & Knight 2004). The usage of cross-functional teams is an important element of internal, cross-functional integration. The roles and responsibilities of sourcing teams engaging in strategy formulation is, in fact, mentioned as a separate theme for further research (Zheng et al. 2007). Team leaders are predicted to play an increasingly important role in the future management task (Carter & Narasimhan 1995), and the purchasing function is expected to adopt its information processing capacity and disseminate knowledge to the remaining organization with increasing pace (Carter & Narasimhan 1995). This thesis focuses on the elements of organization associated with internal integration. Such focus entails examining the formal as well as informal initiatives taken to ensure that goals, time frames etc. are aligned across a number of different departments involved in the purchasing task.

1.2.2. EMPIRICAL MOTIVATION

The increased need for coordination and integration that lies inherently in the purchasing task, due to the increasing complexity, is not easily addressed. Companies operating in this contemporary context have found it difficult to implement structures ensuring integration and coordination (Ellegaard & Koch 2012). As briefly remarked by Carr and Smeltzer (1999a) benchmarking solutions entail hoping that drawing upon experiences from other companies will improve your performance. However, experiences from one company are not easily transferable to another company if the contextual settings are not comparable. An example is that even though cross-functional sourcing teams are often mentioned as a solution to the increasing complexity of purchasing; then the use of teams is actually often questioned, as the practical implementation fails (e.g. Rozemeijer & van Weele 2007).

During the course of the PhD study, the author was part of the Sourcing Excellence research project funded by The Danish Industry Foundation. The research project was supported by the participation of several larger Danish industrial companies. These companies participated on a voluntary basis in an effort to improve sourcing performance. All three of the included cases have participated in the Sourcing Excellence at some point during the duration of the research project.

The three conducted case studies all had a project-based structure. Judging on the statements put forth by the industrial partners, a project structure can make it even more difficult to ensure integration and coordination, as there are higher task complexity and uncertainty than in conventional mass-producing companies. Likewise Cox (2009) argues that project-based organizations receive lower benchmark scores than process based companies; thus implying that project-based companies are further distant from the *currently available idea performance* that the companies are benchmarked against. Studying companies in a project context is

therefore an opportunity to examine integration and purchasing organization within a complex setting.

1.3. RESEARCH OBJECTIVE

This doctoral thesis is concerned with the organization of purchasing. More specifically, focus is on internal organization and orientation towards internal stakeholders within the focal company. Hence, purchasing is in this thesis regarded as a process primarily driven by the purchasing function.

Investigating the concepts integration and coordination in conjunction with purchasing organization does not address a never-before researched gap at an overall level. The motivation behind this thesis is reconciliation of viewpoints on purchasing organization and especially cross-functional team usage in purchasing with the practical reality found in empirical studies. Thus, one of the objectives is to explore what promotes and hinders integration and effective organization – especially concerning the usage of cross-functional teams. It is not argued that there is a direct mismatch between previous research and the practical reality faced by companies. Rather the aim is to extend existing perspectives. This doctoral thesis aims at enriching the current knowledgebase by exploring purchasing organization with a focus on how cross-functional teams and integration are handled in practice, including both formal and informal integration mechanisms.

It is worth noticing that Van Weele and Van Raaij (2014) conclude on the basis of Spina et al. (2013) that there is a potential mismatch between most research on PSM evolving around the focal company or dyadic relationships, and the complex environment that most companies operate in today. This thesis follows in the same line of research. Although, attention is solely applied internally, the underlying premise for the research at hand is that the complexity of the environment should be taken into account when organizing for purchasing. The premise accepted here is that when organizing internally, the external pressures must be considered to create fit and alignment, thus allowing the focal organization to create the best opportunities to operate in the environment. Yet, the author of thesis acknowledges the metaphor that you need to put on your own oxygen mask before assisting others. Essentially this means that addressing internal organization and creating alignment, integration and communication are viewed as prerequisites for effectively addressing external relations (e.g. Horn et al. 2014). Hence, the internal perspective is the motivation for this thesis aiming to research different aspects of purchasing integration and cross-functional team usage.

The focus of the research at hand provides the opportunity to address internal organizational elements, as these are some of the factors that the focal company can itself dispose over.

1.3.1. RESEARCHING INTEGRATION, COORDINATION AND SOURCING TEAMS

Most current research on the topic apply survey methodology (e.g. Cousins et al. 2006; Giunipero & Pearcy 2000; Quintens et al. 2006; Goh et al. 1999; Johnson et al. 2014; Miocevic 2011; Driedonks et al. 2010; Driedonks et al. 2014). For instance, Kiratli, Rozemeijer, Ruyter and Jong (2015) and Kiratli, Rozemeijer, Ruyter, Hilken, et al. (2015) investigate creativity in sourcing teams utilizing a quantifiable scale, and Driedonks et al. (2014) test hypotheses regarding direct and indirect effects of i.e. employee involvement and team composition of sourcing team effectiveness. In the latter, team composition is measured as the number of different functional backgrounds represented by the team. Applying a qualitative approach, a construct such as team composition could, for instance, be further elaborated on by addressing the active participation of these functions. For instance, some functional employees might be present by name but not effort.

As such, this thesis applies a different approach to researching integration and cross-functional teams. In order to increase the understanding of why some constellations work and others do not, it is the aim to gain access to participating individuals' assessments and opinions. As is argued in Paper 3, it is not enough to establish that a given integration mechanism is present. Exploring how teams influence the overall level of integration requires an examination of the subtle relations between a wide variety of functions. Taking a more subjective approach allows to establish how well a given integration mechanism works and in which ways it may influence the overall level of integration.

Furthermore, the concepts of integration and coordination are dependent on the individuals participating in the process. Hence, asking individuals to express their opinion is a valid approach to collecting knowledge about the topic. In an interview, on the other hand, the interviewer has the possibility to ask for elaborations. The narratives that can be uncovered during interviews are useful for uncovering rich details and respondents' nuanced thoughts on the topic. Furthermore, a qualitative approach allows for each respondent to address only the topics that they are knowledgeable about and comfortable answering.

Furthermore, a conversation may reveal actions or thoughts rendered uninteresting by the respondent but relevant for the research. For instance, some stories can reveal actions performed outside the official, formal structures, which may very well influence the overall integration level. These are insights that can be uncovered when approached qualitatively, as respondents are provided the opportunity to elaborate on their thoughts and impression in their own vocabulary. A survey can be constructed to capture informal structures by specifically asking for the presence of such. However, for the research presented in this thesis a qualitative approach is deem more suitable, as the aim is to answer *how*-questions, which makes qualitative approaches suitable (Yin 2014). Adopting a qualitative approach entails engaging with fewer respondents than if a survey had been used. However, qualitative

interviews make up for this by being in-depth and exhaustive in their examination of the topic. Finally, the qualitative data may be analyzed from multiple angles, as the researcher can ask questions revealing insights from the individual perspective as well as within the team or across groups. Hence, multiple units of analysis may be applied. This allows for enriched perspectives to be applied on the collected data; which is yet another argument supporting the usage of qualitative data collection methods as they bring an additional depth to the exploration of purchasing organization and cross-functional integration.

1.3.2. RESEARCH PROBLEMS

The research objective addressed in this thesis is not a streamlined progression. Rather it attempts to uncover different (but still linked) aspects related to organization of purchasing and more specifically interdepartmental integration and cross-functional sourcing teams. In the efforts to address the research objective, the following general research problems are addressed. The term *research problem* (RP) is applied, as it refers to more general issues to be addressed within PSM research. This doctoral thesis adds to the illumination of these problems, but does not claim to solve them exhaustively. The more widely applied expression *research question* (RQ) is reserved for each of the included papers. The three research problems addressed are:

Research problem 1: What are the characteristics of an effective or ineffective purchasing organization?

Research problem 2: How do various characteristics of cross-functional purchasing teams contribute to team performance?

Research problem 3: How do different formal and informal integration mechanisms affect overall integration between purchasing and other purchasing relevant functions?

The first research problem is quite broad in nature. This is intentionally as the aim of the first RP is to gain a general overview of the theme *purchasing organization.* In this dissertation, the research problem is addressed by including concepts from contingency as well as organization theory. The second research problem draws upon social psychology as well as purchasing theory to elaborate on the dynamics of cross-functional sourcing teams, while the third research problem is addressed utilizing the concepts of integration and differentiation originally introduced by Lawrence & Lorsch (e.g. 1967). For the purpose of answering these research problems, this dissertation is based on five scientific papers either submitted or published in peer-reviewed journals or presented at international conferences.

The papers included in this dissertation deal with different problems related to purchasing organization, integration and/or cross-functional sourcing teams. They interlink through commonality in themes, see Figure 1. In essence, the topics are viewed as different progression levels – a funnel going from the overall aggregation level towards a narrower and more specific scope. In short, purchasing organization is the overall topic. Part of the organizational design is addressing the level of differentiation with appropriate integration mechanisms (middle level). A core part of integration is cross-functional teams (lower level), where the notions of cohesion and alignment become relevant.
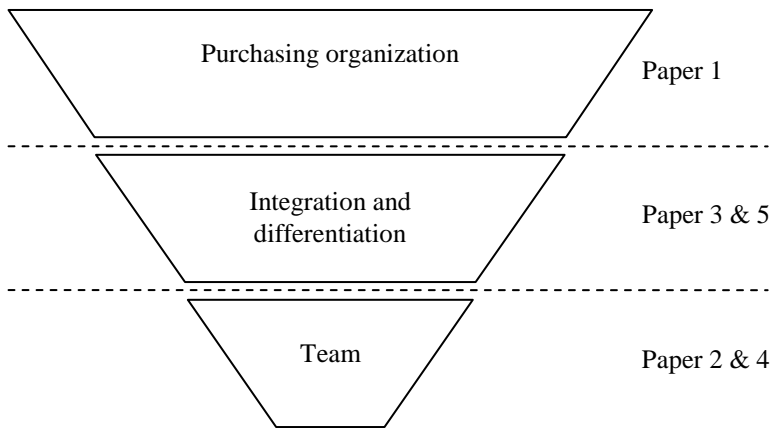
Figure 1: Graphical illustration of the links between the topics and papers included.

As illustrated above, the five papers have not been written in consecutive order. It is not a chronological approach, but rather exploration of multiple aspects and concepts related to the overall research objective. They illustrate the process of uncovering different themes related to the research questions.

The content of the five papers are elaborated in Chapter 4. However, to further illustrate the relations between the overall research problems of the thesis and the specific research questions addressed in the included papers are presented in Figure 2 and further outlined in Table 2.
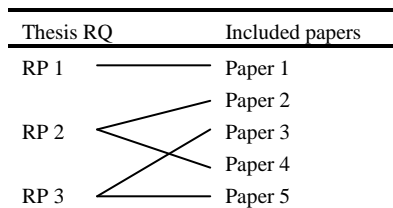
Figure 2: Linking papers to RPs.

Table 2: Elaborating on the links between RPs and included papers.

Research questions in the papers included in this thesis	How the papers address the research problems of the thesis
Paper 1 *No specific research question included.*	**Paper 1 and RP1** Presents a literature study and overview of current approaches towards organization of the purchasing function. Furthermore, the paper discusses and questions how fit can be obtained between the purchasing task and purchasing organization.
Paper 2 Which factors affect sourcing team alignment?	**Paper 2 and RP2** Empirically founded in case study Alpha the paper addresses team alignment. Focusing on exploring why two similarly organized groups perform very differently, the paper finds that the external as well as the internal characteristics of the teams represent possible explanatory factors for the differences in performance.
Paper 3 How is internal integration achieved in a cross-functional sourcing setting?	**Paper 3 and RP3** Based on a discussion of formal and informal integration mechanisms applied within case study Beta, the paper discusses how the quality of the implementation of the identified integration mechanisms may influence the overall evaluated integration level.
Paper 4 How does group (team) cohesiveness influence the performance of cross-functional sourcing teams?	**Paper 4 and RP 2** This conceptual paper focuses on extending the concept of team cohesion from social psychology to a sourcing context. Three propositions are formulated linking elements of cohesion to overall team performance, and yet another three propositions concern the relationships between sourcing team characteristics and cohesion.
Paper 5 How do managers in different functions cope with high differentiation in a poorly integrated project manufacturing organization?	**Paper 5 and RP 3** Empirically founded in the cases Alpha and Beta, four types of behavior exhibited by respondents are identified as coping approaches to the high differentiation/low integration setting.

1.3.3. LIMITATIONS

In this thesis focus is on strategic purchasing and sourcing tasks. Hence, the operational call-off is not in focus. Neither is souring of non-critical and secondary items, commodities or services. In short, office supplies or non-strategic items are not included in the scope. Rather, it is the acquisition of strategic commodities that is in focus.

The empirical research presented does not take into account the position of the investigated focal companies in larger global groups and networks. Hence, each of them is treated as focal, despite of the investigated units being, respectively, a separate company with foreign ownership, a global maintenance division, and the global headquarters of the group. As the focus of this doctoral thesis is internal; future work should investigate if the position in the global groups is an external factor influencing the effective organization of purchasing. Furthermore, the three cases are all examples of project-based companies; this contextual factor must be considered when generalizing the findings to other industrial settings.

1.4. ABBREVIATIONS ETC.

The following abbreviations are used in this thesis. Please refer back to this list while reading the thesis.

CM: Category management

CPO: Chief purchasing officer

MNC: Multi-national company

OEM: Original equipment manufacturer

PSM: Purchasing and supply management

RP(s): Research problem(s)

RQ(s): Research question(s)

SCM: Supply chain management

Furthermore, it should be noted that the words *purchasing* and *sourcing* are used interchangeably in this doctoral thesis.

1.5. READER'S GUIDE

The aim of this reader's guide is to provide an overview of the thesis as well as provide the reader with the opportunity to link the separate parts of the thesis. The content of this thesis is illustrated graphically in Figure 3.

This initial part of the thesis has the purpose of laying the groundwork by introducing the topic of purchasing organization as well as presenting the theoretical foundation of the thesis. The theory based chapter is separated into three perspectives; purchasing organization, organization theory and integration. Each of these sections, respectively, concern one of the main theoretical themes constituting the foundations of the research at hand.

The second part is related to the research design and execution of the empirical data selection and collection as well as the subsequent data analysis. The methodological considerations and reflections related to philosophy of science provide explanations to the choices made throughout the completion of this study.

The third part contains short summaries of the included papers. Full-text versions are omitted from the publicly available thesis in order to avoid any copyright infringements.

The fourth and final part summarizes and presents discussions and conclusions on the basis of the papers. Both practical managerial implications as well as academic contributions are outlined.

Part 1
- Introduction
- Research objectives
- Theoretical foundation

Part 2
- Methodology

Part 3
- Summary of papers

Part 4
- Discussion
- Conclusion
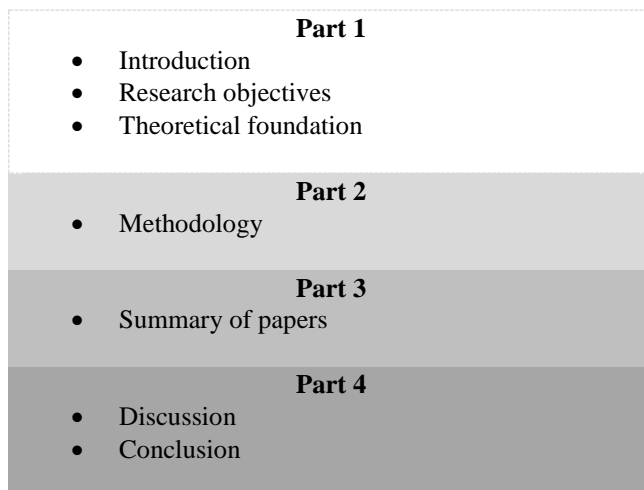
Figure 3: Graphical illustration of the reader's guide.

CHAPTER 2. THEORETICAL FOUNDATION

The purpose of this chapter is to outline the theoretical foundation for the research presented in this doctoral thesis. The broad outlines of the theoretical scope are presented in order to provide the foundation for the research conducted as part of this dissertation. The more focused theory connected to each RQ is presented in the included papers.

This chapter is separated into three main sections, each of which addresses a comprehensive part of the theoretical scope of the thesis. These are respectively; purchasing organization, organization theory, and integration. From a level of abstraction, it may be argued that organization theory is broader than purchasing organization, and therefore should be presented first to create the classic funnel effect, where the scope narrows down as the text progresses. However, the focus of this thesis is exclusively on a purchasing setting; hence, it is argued that presenting the purchasing setting is the primary objective. Hereafter, the organization theory applicable in the presented purchasing setting is outlined. While integration is very much part of organization theory, the concept is core to this thesis, and therefore, the concept of integration is assigned its own section. The logic in the structure is illustrated in Figure 4.
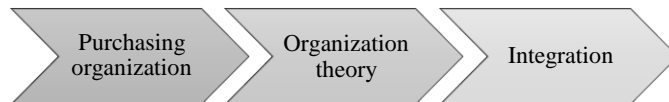
Figure 4: Outline of Chapter 2.

Each of the three sections outlined above is structured as follows:

Purchasing organization

Outlining the different concepts of organizational structures; central, decentral and hybrid respectively, the section focuses on presenting the status of research on purchasing organization. The section concludes with an outline of category management (CM), a specific purchasing strategy prevailing in practice.

Organization theory

This section outlines the premise for organization theory, more specifically focusing on division of labor and the subsequent coordination and integration needs. Furthermore, contingency theory is briefly outlined as it constitutes the fundamental approach to organizing applied in this thesis.

Integration

This final section outlines the concept of integration focusing primarily on internal integration. Integration mechanisms are presented, but focus is especially on teams, which is an approach often applied in a purchasing setting.

2.1. PURCHASING ORGANIZATION

As increasing attention is paid to the purchasing task within companies, the search for the optimum purchasing organization and consequently the frequency of restructuring increase as well (Karjalainen 2011). When addressing the organization of the purchasing task or sourcing process (here used interchangeably), the scope concerns selecting a structure with a suitable set of systems for e.g. division of labour, coordination, communication and authority (Glock & Hochrein 2011). Appropriate purchasing structures are an important prerequisite for the successful management of purchasing (Giunipero & Monczka 1997). Linking to the later Section 2.2.1 on contingency theory; it is argued that the proper organizational structure is dependent on the context (e.g. Karjalainen 2011; Laios & Moschuris 2001). Such contextual factors may be size of the organization, as increasing the size is an approach to handle and thereby reduce uncertainty (Glock & Hochrein 2011). The task of choosing a purchasing structure is not easily done, and the topic of supply organization is an acknowledged theme within research (Trent 2004). In the following sections the concepts of purchasing function and purchasing department are applied. It should be noted that *purchasing department* refers to a specific organizational entity, while *purchasing function* relates to all parties involved in the purchasing task. Hence, an employee can be part of the purchasing function without being situated in the purchasing department.

Spearheaded by the researchers Johnson and Leenders (e.g. Johnson & Leenders 2001; 2006; Johnson et al. 2014) the historic development within purchasing organization in North America has been studied. A total of four iterations of a survey (year 1987, 1995, 2003 and 2011) were conducted targeting both manufacturing and service companies from the United States and Canada (Johnson et al. 2014). The results indicate that in the three periods between the iterations, 33-42 % of the companies changed their organizational structure (Johnson et al. 2014). Summarizing over the entire period of 24 years, and with 23 companies participating in all iterations; 11 companies had the same organizational structure in 1987 and 2011, but only six out of the 24 companies did not change the organizational structure over the years (Johnson et al. 2014). Thus, five companies must have implemented at least one change only to return to the point of origin. Comparing the 52 companies surveyed in the three most recent iterations (1995, 2003 and 2011) shows a similar tendency. These findings lead to the conclusion that most sourcing initiatives gradually fades away when external consultants leave (Rozemeijer & van Weele 2007) indicate that it is not a simple task to identify,

implement and manage an organizational structure – even though it presents a good fit with the environment.

When addressing organization of the purchasing function, another approach to evaluate the evolution is by addressing the role of the purchaser as well as chief purchasing officer. The role of the individual purchaser has been subject to change over time; focus used to be operational in nature and focus on call-offs. However, today's strategic-orientated purchaser needs to have behavioral oriented as well as team skills to create the right relations to external and internal stakeholders (Giunipero & Pearcy 2000). However, albeit this micro-level approach to purchasing organization is important, the role of the purchaser needs to be defined within the context of the overall organizational structure according to which the company is organized.

So, more and more the question prevails how to get organized at a corporate level to capture potential purchasing synergies (Rozemeijer 2000b). However, although plenty of literature on the organization of purchasing exists; it is, as briefly indicated above, not an easy task to design a successful organizational structure. Although research has resulted in models guiding companies towards organizational forms, the simplicity of these models cannot always capture the comprehensiveness of empirical contexts. Rozemeijer (e.g Rozemeijer et al. 2003) is the main driver behind a two parameter model presenting five organizational approaches to purchasing structures. The model, see Figure 5, is constituted by purchasing maturity and corporate coherence. The latter, corporate coherence, is defined as the degree of community in the company across business units. Corporate coherence is high if the alignment between business units is high. Purchasing maturity is related to the professionalism of the purchasing function, which in turn is evaluated based on parameters such as status of the purchasing function, information system availability, and degree of collaboration with external suppliers. Based on the model it is argued that decentralized structures are suitable for instances with low corporate coherence – thus, when companies are diversified. While centralized organizations are appropriate in the cases of high corporate coherence. These findings are not surprising, as a diversified structure will have less common features than a homogeneous structure; thus making it possible to utilize the characteristics of a decentralized structure able to adapt to the divisions' different market situations. If medium values are found then a hybrid structure is suggested, here it is named the coordinated purchasing.
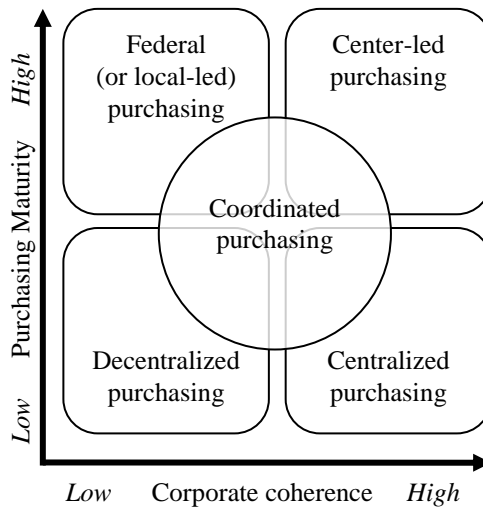
Figure 5: Corporate purchasing organizational approaches from Rozemeijer et al. (2003).

The second axis in the matrix model is purchasing maturity. The concept of purchasing maturity is widely applied in PSM literature, as especially the transformation from a clerical purchasing function to strategic purchasing (e.g. Andersen & Rask 2003) is often depicted as being the opposite ends in a maturity continuum. One of the most recognized maturity models is the *Purchasing and supply development model* presented by Van Weele (e.g. 2014) (see Figure 6). This model shows how the purchasing function develops in terms of professionalism over time, and it adds extra layers by including an organizational structure dimension, where the decentralized structure and functional focus is associated with the three least developed stages. Reversely, cross-functional focus and a centre-led structure (which is essentially centralized) are associated with the three most developed stages. Van Weele emphasizes that the model must be used carefully as all development stages may not be applicable for all companies. Hence, it is not necessarily a criterion for success to reach the sixth and most mature stage. This is an important point to notice in general when addressing purchasing maturity models, as research has shown that a single company may be characterized as mature in one model - while not in another (Heikkilä et al. 2014).Thus, the concept of maturity is relative and must be assessed with caution as it may not be ideal for all companies to reach the top stage. So, while it is often presented as a fixed set of steps, the concept of maturity should be addressed as a relative continuum as similar organizational structures may be suitable for high maturity in one context and lower maturity in another.
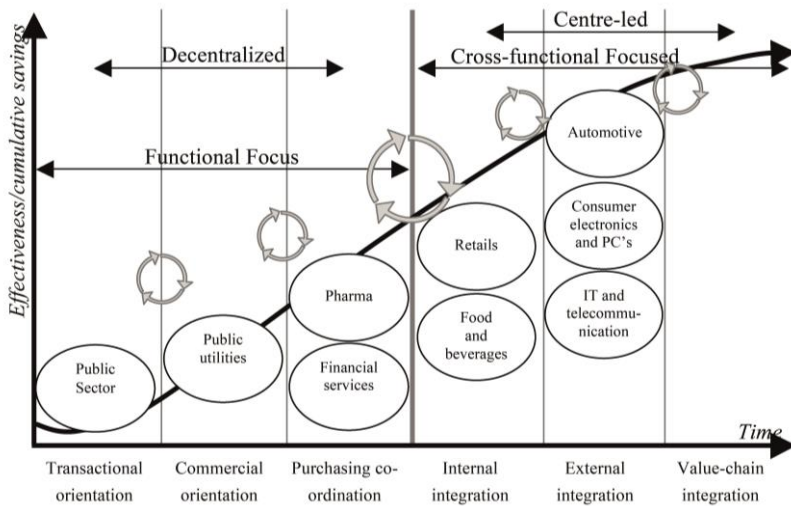
Figure 6: Purchasing and supply development model (van Weele 2014, p. 68).

Therefore, when discussing purchasing organization at a general level, there are many different elements to consider. The following sections look further into multiple aspects of purchasing organization. First, the three main organizational forms, the central, decentral and hybrid structure, are outlined. Second, factors influencing the choice of purchasing organization are deduced from the literature and third, the concept of category management is presented.

2.1.1. CENTRALIZED AND DECENTRALIZED STRUCTURES

In their 2011 literature review Glock and Hochrein (2011) identified the centralization/decentralization discussion as being the most frequently addressed structural characteristic of purchasing organization. Overall the organization of the purchasing task can be in a centralized, decentralized or hybrid structure (e.g. Johnson 1998; Johnson & Leenders 2001). These organizational forms have different attributes making them suitable for different organizational settings.

Two main approaches to determining the degree of centralization – and thus, decentralization – are deduced by Glock and Hochrein (2011). Both of these approaches refer to decision-making authority; one refers to the concentration of decision-making authority, while the other is the position of decision-making authority in the organizational hierarchy. The two may sound alike, but are quite different in their approach to measuring centralization. First, a focus on concentration entails that organizational units are evaluated based on their aggregated decision-making authority. A unit with a highly aggregated decision-making authority can be located at all levels in the organizational hierarchy (Glock

& Hochrein 2011). This perspective is in line with the view presented by Mintzberg (1979, p.181) which reads: "*When all power for decision making rests at a single point in the organization – ultimately in the hands of a single individual – we shall call the structure centralized; to the extent that the power is dispersed among many individuals, we shall call the structure decentralized*".

The second definition takes the position of the decision-making authority into considerations, meaning where the decision-making authority is placed in the organizational hierarchy. In this perspective, a centralized organization has gathered all authority on the upper organizational levels (Glock & Hochrein 2011). In other words, this second view characterizes centralization as the degree of hierarchy of authority (Parikh & Joshi 2005). Continuing, the perception of centralization applied in this research refers to the position of decision-making hierarchy. A centralized purchasing structure is, thus, one where the responsibility and decision-making authority is located in a central purchasing function, which is also held accountable for the performance of the purchasing process.

Internal decision-making authority may, as argued above, be used as a determinant for evaluating the degree of centralization. However, this perspective does not address why the centralized organizational structure is chosen. Taking a closer look at the academic discussion of when and why to choose a given organizational structure, external factors are often mentioned as influencing the appropriate choice. Strategy is one of these factors; e.g. the decentralized organizational structure is suitable for companies adopting a differentiation strategy, while companies opting for a cost strategy should move towards the central structure (David et al. 2002). A hybrid structure may be viewed as an approach to balancing two pressures influencing most companies. One pressure is that of globalization, standardization and efficiency, which promotes increasing centralization. The other pressure is that of customization, differentiation and responsiveness, which can be matched by decentralization (Dubois & Wynstra 2005; Faes et al. 2000). The choice of organizational structure has significant impact, as it influences the corporate activities handled by the purchasing organization, e.g. maintaining corporate alliances and environmental planning is more widely applied in centralized than decentralized structures (Johnson et al. 1998).

Johnson and Leenders (2006) conclude that there is ambiguity regarding whether centralization or decentralization will be the predominant organizational form in the future. This might underline the point that the best organizational form is context dependent, which is one of the conclusions in Lidegaard et al. (2015). The challenge is then to find the optimal degree of centralization and, hence, decentralization (Arnold 1999) that allows a specific company to conduct an effective sourcing process. Please refer to Section 2.1.3 for further elaboration on which factors may influence the organization of the purchasing function. The next sections takes a more thorough look on the central, decental and hybrid structure, respectively.

Central structure

Mintzberg (1979) states that companies should decentralize because one brain cannot comprehend all the decisions necessary to run a company. Obviously, this cannot be disputed; however, it might be overly simplified to argue that centralization requires just one single brain to rule them all. Rather, a centralized structure, in accordance to the outline made above, is viewed as a structure with the majority of decision-making authority located close to the strategic apex of the company. Thereby, a centralized purchasing organization places the purchasing function in close proximity to the strategic apex and in the top of the organizational hierarchy. A study by Giunipero and Monczka (1997) found that centralization was primarily evident, when a corporate purchasing function rather than the operating units had decision-making authority. This corresponds well with the notions above, as the power to make decisions is placed with the purchasing function. Van Weele's (2014) purchasing and supply development model indicates that a centralized structure is representative for the highest developmental stages. These stages are characterized by focusing on integration, respectively, internal, external and across the value chain (van Weele 2014). Other researchers mention striving for global efficiency and effectiveness – in essence a professionalization – as a promoter of a centralized purchasing function (Faes et al. 2000). Monczka, Trent, and Handfield (1998 cited in Johnson & Leenders 2001, p. 6) observed that "[a]*s the scope and importance of purchasing increased … firms increasingly recognized the necessity of a centralized group to coordinate the overall purchasing effort*". This supports the notion above that a centralized structure equals maturity. However, taking such a perspective has its drawbacks, as it cannot exclusively be argued that centralization equals maturity, as discussed above. Companies' frequent changes (e.g. Johnson & Leenders 2006; Johnson et al. 2014) between the two overall types of structures may be viewed as a pendulum swinging back and forth dependent on the ever changing context (Tchokogué et al. 2011). Furthermore, as outlined by Heikkilä et al. (2014), it may even be questionable how to assess maturity as different models gives different results on a maturity continuum for the same company. Stating that centralization is suitable for mature organizations is, therefore, a matter of opinion. Continuing in this overview, this notion of maturity equals a centralized structure is discarded; instead an alternative perspective arguing that the context is the main influencer of the appropriate purchasing structure is adopted. Hence, a centralized structure should be applied because it provides the better fit between the purchasing task at hand and the context, rather than because a centralized structure may always be regarded as a sign of maturity.

That being said, some of the listed advantages of implementing a centralized organization are often perceived as obtainable to a mature purchasing organization. Such advantages of the centralized structures are related to specialization, which may be evident through e.g. achieving a stronger bargaining power towards the suppliers and in-depth market specific knowledge (Matthyssens & Faes 1996), or

increased knowledge due to the dedication of staff as well as resources (Dröge and Germain, 1989 in Johnson & Leenders 2006; Matthyssens & Faes 1996). Other advantages are related to avoiding sub-optimization as decision-making authority is kept close to the strategy formulating apex (Matthyssens & Faes 1996), as well as improved coordination due to the shorter span of scope between the resources allocated to the sourcing task, as they are all located in one central unit (Johnson & Leenders 2001; 2004). A central structure often has design features such as centrally-led commodity teams to disseminate knowledge and ensure alignment (Trent 2004). Also, centralization is argued to produce leaner processes and procedures, less administrative work and, subsequently, a reduction of purchasing organization expenses (Matthyssens & Faes 1996). These advantages fall in line with the risks of decentralization mentioned by Arnold (1999). He outlines that the risk of decentralization is decentral units being too small to capture global purchasing synergies in effective ways. Also it is a risk to lose alignment of strategic orientation between the units. A centralized structure should address these two risks successfully.

While the section above has focused on centralized solutions to the issue of organizing; the following section further outlines the nature of a decentralized purchasing structure. Presuming a correlation between the information processing needs in an organization and its maturity; Galbraith (2012) presents two different approaches to coping with increased information processing needs. The first being in accordance with the above presented centralized structure; thus, increasing the capacity in the hierarchy through a centralized mechanism (Galbraith 2012). The second approach concerns lateral coordination forms supporting decentralized interdependence (Galbraith 2012).

Decentral structure

A decentralized structure places the decision-maker closer to internal customers and/or the external environment, which is argued to both lower cost, increase speed and make the use of local sources more effective (Faes et al. 2000; Johnson & Leenders 2001; 2004). From a purchasing perspective, a decentralized structure entails that different organizational entities share the responsibility for carrying out the purchasing tasks; in other words: operating units have the primary decision-making authority (Giunipero & Monczka 1997). There are multiple ways an organization can practice decentralization. Looking into differentiation, as proposed by Mintzberg (1979), a company can differentiate based on customers, markets or products. These three organizational designs can represent different approaches to designing a decentralized structure. Hence, decentralization can have many forms, but common for them all is, as mentioned above, that execution of the purchasing activities are conducted by decentral business units, divisions or factories.

Decentralized structures can create a situation of internal competition amongst separate units (Arnold 1999) as intrapreneuership may occur (Arnold 1999). Advantages of decentralization are e.g. that it allows for closer collaboration between buyers and suppliers as well as customers (Matthyssens & Faes 1996). The responsiveness of the purchasing responsible is high in a decentralized organization, which may result in e.g. both better and faster service and goodwill within a local community (Matthyssens & Faes 1996; Mintzberg 1979). Decentralization provides business units with autonomy and gives them control of purchasing activities. The decentral units are thereby held accountable for performance (Johnson & Leenders 2006), which may promote higher motivation amongst the local purchasers (Matthyssens & Faes 1996; Mintzberg 1979).

Hybrid structure

While the centralized and decentralized structures are often addressed in the literature, most companies implement a hybrid structure containing elements from both of the above. The essence is that purchasing activities are shared between a centralized corporate purchasing function and decentralized business units, factories and/or divisions (Johnson et al. 2002). Glock and Hochrein (2011, p.158) conclude that "*hybrid POs* [ed. purchasing organizations] *are most commonly used in many industries and that a shift towards a higher use of hybrid POs has occurred over time*". This tendency was also evident in the research by Johnson and Leenders (2001; 2006), as the hybrid structure had slightly increased its prevalence to 68 percent amongst the participating companies in 1995 (Johnson & Leenders 2001). Their most recent iteration from 2011 is more concerned with the changes made by organizations, and it does not specifically address how many participants operate one of the three variations of the hybrid structure (Johnson et al. 2014). However, looking at the structural changed implemented by the companies, the three most common changes were from centralized to centralized hybrid, secondly from decentralized to decentralized hybrid, and finally from decentralized hybrid to hybrid (Johnson et al. 2014). The strong indication of an increase in the usage of the hybrid structure could be explained by the variety of structures covered in the hybrid form (Johnson et al. 2014). Which, again, is one of the reasons for researchers calling for further investigation into the hybrid structure's various configurations (Johnson & Leenders 2006).

The reason for the popularity of the hybrid organizational structure is that the combination of central and decentral features allow organizations to harvest both global coordination and responsiveness to local stakeholders (Hartmann et al. 2007), while cushioning the drawbacks of both of the other structures (Dubois & Wynstra 2005). Thus, hybrid structures have the advantage of combining the features of both the centralized and decentralized structures (Johnson et al. 2014). Utilizing a hybrid organizational structure allows companies to fit their organization to their specific environment and situation. It should be noted that dependent on the

configuration, the hybrid structure can turn into a quite complex structure resulting in high coordination costs (Rozemeijer 2000a).

2.1.2. FUNCTIONAL DEPARTMENTS AND TEAM USAGE

The above listed considerations concerning purchasing organization address where the responsibility of the purchasing process is placed on a broader company-wide level. Adopting a more micro-oriented unit of analysis provides the opportunity to discuss organization within the purchasing function itself, rather than focus on the organizational hierarchy of the entire company. Taking this different perspective moves focus onto the organizational design mechanisms and integration initiatives implemented to ease the tasks and activities of the purchasing function – whether this is centrally or decentrally placed in the organizational structure. There are two main perspectives to be taken upon purchasing organization; one being operationalizing through functional department(s) and the other being usage of cross-functional teams.

From a traditional point of view, purchasing includes identifying and selecting suppliers prior to the contract as well as placing orders with suppliers post contact. To perform these jobs purchasers are pooled into functional departments where employees have similar skillsets and perform jobs that are alike (Arnold 1999). The functional span of control, hence, the number of activities brought together in one functional organizational structure, is strictly limited to purchasing related tasks. However, due to changes in the nature of purchasing processes towards a more strategic and integrated functionality, the role of the purchasing function has evolved.

Over the recent years a new trend within purchasing organization has emerged (Trent & Monczka 1994): organizing the purchasing process through cross-functional teams. These teams are implemented to address the traditional coordination problems of a functional organization. The position of these teams is similar to the situation of high product complexity combined with high commercial uncertainty in van Weele's (2014) *Buying situations typology*. In this setting, purchasers must become team players (Faes et al. 2000). Referring back to the research by Johnson and Leenders (2006), the use of cross-functional sourcing teams were increasing in the double respondent group from 1995 and 2003. Furthermore, it may be hypothesized that decentralized purchasing organizations employ purchasing teams to a lesser extent than companies with a centralized or hybrid structure (Johnson et al. 2002).

It must be noted that the use of a functional department and teams do not mutually exclude one another. The two approaches may very well complement each other in the same structure. Purchasers can be located in a functional department, while still participating in cross-functional teams. While these mutually non-exclusive concepts can co-exist, it is not an easy task to balance the two approaches, as each

of the participants in a cross-functional team need to balance goals from their respective functional departments and the cross-functional team. The review and discussion of purchasing teams are continued in Section 2.3.4., because teams are considered a way of creating coordination and integration across different functions or specialisations – and it is, thus, an integration mechanism.

2.1.3. FACTORS INFLUENCING PURCHASING ORGANIZATION

The underlying assumption behind this section are associated with the contingency perspective explained in Section **Fejl! Henvisningskilde ikke fundet.**. According to this perspective, creating a fit between the purchasing organization and the environment will lead to efficiency (Lawrence & Lorsch 1967). Here the environment should include factors related to the remaining organization in which the purchasing organization must operate. Despite of a focus on purchasing, it is worth noticing that major changes in the organization of purchasing is often a direct consequence of changes in the overall company structure (Johnson & Leenders 2001). Thereby, it is necessary to look beyond the purchasing context to determine the proper structure fitting the purchasing process and task in a given company. Based on research in the field of PSM, Rozemeijer (2000a) lists five design rules for purchasing organization:

- Consider organizational goals and strategies
- Take into account business unit concerns
- Involve cross-functional aspects early
- Build mutual trust and credibility with business unit managers
- Address the side effects of purchasing initiatives

From these rules, the importance of purchasing's linkages with the remaining organizational functions is stressed, as both cross-functional aspects are clarified and the effects of purchasing's actions on the remaining organization should be assessed. Other research within PSM literature is concerned with the factors influencing purchasing structures. Glock and Hochrein (2011) conducted a review of purchasing organization and design in which they classified the contextual factors influencing purchasing organization structure (see Table 3).

Table 3: Contextual factors identified by Glock and Hochrein (2011).

Contextual factors		
Company-external factors (14)	Country of origin (1)	
	Industry sector (6)	
	Environmental uncertainty (7)	
Purchase situation (13)	Time pressure (3)	
	Percieved risk (3)	
	Purchase importance (6)	
	Buyphase (7)	
	Buyclass (11)	
Product characteristics (18)	Purchasing volume (5)	
	Purchase complexity (7)	
	Product type (11)	
Organizational characteristics (19)	Organizational strategy (4)	
	Buyer characteristics (5)	
	Size of the buying organization (8)	
	Structure of the organization (10)	

Please note that the number in the brackets indicate the number of papers that mention the contextual factors and that multiple factors may be mentioned in the same paper.

Despite the extensiveness of the work by Glock and Hochrein (2011); literature is full of different suggestions for contextual factor. Some are similar to those listed above while others are additional. Table 4 represents an effort to clarify which factors are relevant in a purchasing context. This list is not argued to be exhaustive, but it fulfils the intension of outlining examples from which overall characteristics can be deduced.

Table 4: Examples of determinates of purchasing organizational design.

Reference	Examples of factors influencing purchasing organization
Cousins et al. (2006)	Strategic planning within purchasing, purchasing's status within the organization, internal integration and the skill level within purchasing
Faes et al. (2000)	Degree of formalization through: formalized regular meetings, formal rules of conduct, delegation of responsibilities, good planning exchanges, and visibility of results
Giunipero and Monczka (1997)	Sourcing authority Specialization of purchasing staff Purchasing structure and policies
Rozemeijer (2000) + Rozemeijer at al. (2003)	Business context, strategic focus, organizational context, and purchasing maturity
Glock and Hichrein (2011)	The structure of the organization as a whole, e.g. corporate policies and regulations

Based on the above, it is deduced that purchasing's organization is dependent on its strategic orientation; whether it is operative in nature and, thus, reacting to demands only, or strategic and contributing to securing future potential growth also (e.g.

Arnold 1999). This notion is supported by Cousins et al. (2006), who list four determinants of purchasing organization; where the first refers to answering if purchasing is strategic or not? The correlation between strategic importance and organization is hypothesised by Johnson et al. (2002) to be: if the purchasing function holds, relatively, less of a strategic role, then a decentralized structure is more appropriate than a centralized or hybrid structure.

Further, the size of the purchasing organization is, logically, argued to be influential on the organization of the purchasing function, as larger companies often has more complex structures then smaller once (Trent 2004). Also, numerous factors are identified as negatively influencing the success of an implemented purchasing structure. These are, for instance, lack of awareness, lack of skills, lack of motivation and lack of opportunity (Bals et al. 2009). Each of these four is related to managerial support. Thus, one element that cannot be overlooked is the impact that managerial support has. A wide spectrum ranging from e.g. budgetary to motivational influencing factors exists. The influence of managerial support is briefly discussed in Lidegaard (2015).

When looking at the organization of the purchasing function and process, Cousins et al. (2006) state that although the field has received considerable attention, there is still little empirical evidence illustrating the current status of the purchasing function within organizations. Thereby, the organization of purchasing needs additional attention as well, because it is dependent on purchasing's relations to the remaining organization. The list presented above is, therefore, not a complete overview of the numerous factors mentioned in the PSM literature. However, it represents some of the core elements to be considered when organizing.

When purchasing organization is addressed, there is an extra dimension to be considered besides the concepts of centralized, decentralized and hybrid structures. This approach to organizing is independent from the overall structures presented above. Category management, as it is named, can be implemented in different variation in each of the overall structures. The following section looks into the trending approach to organizing the purchasing tasks.

2.1.4. CATEGORY MANAGEMENT

Category management is an overall purchasing strategy originating from retailing. In supermarkets, a category manager is often given the responsibility to procure a given group (also denoted category) of goods. Recently the concept has been adopted by other industries, and today purchasing category management is one of the dominate strategic purchasing paradigms (Ellegaard & Møller 2013). The aim of establishing category management – and consequently category teams – is obtaining economies of scale by pooling purchases (Heikkilä & Kaipia 2009). The challenge with implementing category management within purchasing is that it

encompasses new types of activities to be handled within the purchasing process (Heikkilä & Kaipia 2009). Within academia, category management is acknowledged by one of the most widely applied textbooks within the area of purchasing and supply management. From his 5th edition and onwards van Weele (2014) includes a chapter on category sourcing in the publication *Purchasing and supply chain management*, and thereby acknowledges that organizing sourcing into categories is at the heart of a professional purchasing organization. Despite of this increased focus on category management in purchasing practice, the concept is still poorly understood in research literature (Heikkilä & Kaipia 2009; Ellegaard & Møller 2013), and the concept of category management is difficult to define (Ellegaard & Møller 2013). There is, thus, little academic knowledge accessible for companies to refer to when forming or managing categories (Heikkilä & Kaipia 2009), as most knowledge on the topic is owned and protected by professional consultancies (Ellegaard & Møller 2013). Within the setting of purchasing and supply management, category management can be viewed as an approach to group spending into:

> "*A group of coherent products and services, bought from the supply market that are used in our company to satisfy internal or external customer demands.*" (van Weele 2014, p.197)

In this perspective category management is an analysis comprising the formulation of categories and sub-categories through steps such as technical specifications and supply base analysis, and ending with overview of the resources necessary to implement category management (van Weele 2014). Similar views on category management include that presented by O'Brien (2015), he lists a five step process to be followed when segmenting external spend into categories. His definition of category management reads: "*The practice of segmenting the main areas of organizational spend on bought-in goods and services into discrete groups of products and services according to the function of those goods or services and, most importantly, to mirror how individual marketplaces are organized.*" (O'Brien 2015, p.6).

Category management is in this thesis, and in the related research, viewed as the consolidation of sourced raw-materials, components and services consumed or transformed within the focal company into groups with similar characteristics.

An examination of the current state of purchasing in a Danish context reveals implementation of category management as one of four key initiatives detected amongst the investigated companies (Møller et al. 2012). Here category management is understood as the pre-contractual guiding principles and methods aimed at cost reduction through bundling of, respectively, resources, volume and knowledge into purchasing teams (Møller et al. 2012). Further elaboration of the category management process is offered by Ellegaard and Møller (2013), who

aggregate multiple consultant's frameworks into one generic category management process, see Figure 7. The four step process contains activities from setting up the categories to selecting and managing suppliers. Thereby, this generic process stresses the far-reaching implications of category management.

Internal analysis and organizing/influencing	External analysis and category/sourcing strategy development	Supplier selection, contracting, and realization	Collaborative development and CM process re-initiation
• Identify categories • Category team formation • Stakeholder management • Opportunity analysis • Needs/wants determination • Internal analysis (spend etc.)	• Supply market research/analysis • Supplier insights • Price/cost analysis • Power leverage analysis (Kraljic) • Ideas and option creation • Category/sourcing strategy	• Supplier short list • Tender process (+ e-auction) • Choice of supplier • Negotiation • Contract formulation • Implementation	• Problem/opportunity analysis • Deciding collaboration interface • Joint innovation projects • Continuous internal/external analysis • Deciding to re-initiate CM

Figure 7: The generic category management process by Ellegaard and Møller (2013, p. 2).

Referring back to the research of Johnson et al. (2014) the use of categories is examined as part of the survey, and categories are defined as the areas of responsibilities, e.g. IT services, freight, raw materials etc. In the double respondent group from 2003 and 2011, the trend indicates increasing levels of purchase category responsibility (Johnson et al. 2014). This very broad mandate given to purchasing can illustrate the development predicted by Trent and Monczka (1998). They foresaw that future purchasing teams would be organized according to end-items rather than by commodity. As a consequence, purchasing must become integrated with other functionalities within the organization (Trent & Monczka 1998).

Consolidation of commodities

As can be derived both from the above, the main driver behind category management is the consolidation of purchased goods or services into categories with similar characteristics. The trend of dividing the purchased items into groups of similar characteristics was especially boosted by the now famous two-by-two matrix introduced by Kraljic (1983). Arguing that purchasing must become supply management, Kraljic segmented purchased commodities, and proposed different strategies for handling suppliers in each of the quadrants; non-critical items, leverage items, bottleneck items, and strategic items. Although the approach has later been criticized for not addressing the aggregation level on which the product should be characterized or how do deal with suppliers delivering into multiple of the quadrants in the matrix, the underpinning concept prevails. Consolidating items for purchasing and simplifying the purchasing task is still applied in practice. Focusing on the concept on consolidation, it is evident that categories may also be formed with different foci dependent on the approach taken to consolidation. Segmentation into categories may be based on product line (Zenor 1994),

similarities of the components (Trautmann et al. 2009) or both tangible and intangible similarities between the purchased products (Heikkilä & Kaipia 2013). The question remains: *what characterizes a category*?

As mentioned above, this research adopts a broader view on category segmentation, as the reasoning for categorization is not as important as how this specific categorization influence the choice of organization. In two of the empirical cases studied in this thesis, the categorization has been on component characteristics. In case Beta the categorization stems from a group-level decision. Here a specific approach to coding and classifying components is enforced partly due to the group ERP-system. Likewise in Company Delta a central strategic purchasing function is in charge of the categorization. In the third case (Alpha), the categories were segmented based on end-products.

Category management in an organizational context

As hinted above in the research by Trent and Monczka (1998), category management is not a separate organizational form, but an approach implementable both in centralized, decentralized and hybrid structures. Category management can be understood as a purchasing strategy – an approach to organizing all purchased commodities and services and acting accordingly.

Not only can category management be implemented in all three of the overall organizational forms presented above. It can also be incorporated within both the perspectives presented in Section 2.1.2 – those of functional departments and teams. However, the implementation of category management is often associated with the implementation of teams. Therefore, these teams are arguably a rational choice of unit of analysis when addressing category management. As mentioned before, the concept of team usage within sourcing is further outlined in Section 2.3.4. However, category management is in some cases strictly purchasing related and confined to the purchasing department. In these cases, the surrounding organization is not involved in category work, and may very well be unaware of the existence of categories. This set-up requires the sourcing department to be flexible in the sense that it needs to find other integrate modes with the remaining organization than teams. A different integration task is faced when category management utilizes a team set-up. This integration task is different, as the team members are aware of the set-up they participate in, as well as the need to juggle their association with their own department with that of the team. To foster and manage such integration a category manager is often employed. In Hartmann et al. (2008) all of the eight case companies used a category manager as the managerial role creating linkages within the teams and between team and the remaining organization. Furthermore, the category manager has the opportunity to gain in-depth knowledge about the supply market and specialize in given a category (Ellegaard & Møller 2013). The argument is that the category manager can then utilize this knowledge to purchase items at the

lowest possible cost (Ellegaard & Møller 2013). To achieve these prospected benefits of category management, the category manager needs to balance the category optimally from a company perspective. However, as easy as it may sound, the practical obstacles are multiple, as the category manager's possibility to coordinate and integrate across the organization is dependent on a wide variety of contextual factors; e.g. the classification of commodities, the design of purchasing organizational structure, managerial oversight etc. Furthermore, the concept of category management is still relatively nascent in non-retail organizations, and there is a need to conduct further research on the practical implementation of category management.

The sections above have outlined theoretical perspectives connected to purchasing organization, and illustrated the complexity of the multiple factors influencing the purchasing organization. This thesis concerns the organization of purchasing processes in large Danish industrial and project-based companies. By focusing on purchasing organization, the research will not only focus on the overall organizational structure status as centralized, decentralized or hybrid. The design of processes and division of labour related to purchasing will be addressed in terms of how it influences the internal relations, integration and coordination mechanisms set in play to support and comprise part of the purchasing structure.

2.2. ORGANIZATION THEORY

Classical organization theory is applied to provide in-depth understanding of the organizational challenges of purchasing. The aim is to utilize organization theory to further the understanding of purchasing organization and the challenges related hereto. An organization is a purposeful system of people and resources. Organizational structure may be defined as the "*formal relationships of roles and tasks to be performed in achieving organizational goals, the grouping of these activities, delegation of authority, and informational flow vertically and horizontally in the organization*" (Stanley 1993, p. 212 citing Park and Mason, 1990). In this perspective, organizational structure includes concepts such as the division of labour, delegation of responsibility, and coordination of information flows. Organizational design is the process of assessing and selecting an organizational structure (Glock & Hochrein 2011).

This section outlines some of the concepts central to the organizational structures in companies. The need for organization emerges when it grows to a point where work or roles is divided between different individuals or entities. The concept of division of labor is often derived back to Adam Smith's (1776) publication. His main argument is that work is more easily understood if separated into tasks (Shafritz et al. 2005). When viewing organizations as systems for getting certain work done, the first step in characterizing an organization involves defining the work done (Perrow 1967). When tasks are divided between different units or individuals then the

organizational complexity raises and measures needs to be taken to ensure that all tasks are still performed efficiently.

An element to be considered when addressing a given workflow is the *variety* of the required competences needed to complete the task at hand. Perrow (1967) focuses on analyzing the technology applied, as technology is understood as the actions performed by individuals to change an object. During this transformation - in essence the work flow - individuals need to interact. If variety is high, then a combination of various competences is required, and the interaction between individuals is consequently high. This creates dependencies between the different individuals, departments or division as a need for information exchange emerges. Information flow becomes a force to be recognized, as it is the foundation of coordination influencing the ability for individuals or units to conduct their tasks. Furthermore, the decision-making hierarchy is ultimately influenced by the division of labour, as the communication structure needs to take into account the multiple entities that need to work together.

In organization theory, we find constructs aiding in characterizing the consequences of the chosen division of labor. Utilizing these to describe an organization's work processes and tasks enables an enriched understanding of the synergies, interplay and links between the tasks conducted in the organization.

Interdependence

Interdependence denotes the extent to which activities are dependent on each other. Interdependency emerges as output of one activity becomes input to another activity. According to various organization scholars the organizational structure should match the identified interdependencies by applying appropriate modes of communication, coordination and proximity (e.g. Daft 1992). There are different types of interdependence; pooled, sequential and reciprocal (Thompson 1967). The intensity of the linkages between the units determines the interdependencies (Victor & Blackburn 1987). The scale of interdependence presented by Thompson (1967) has some weaknesses, as it is relatively difficult to determine in practice what low, medium and high communication need is. Some researchers further ask the question: *Are three pooled interdependencies greater or less than one reciprocal interdependence?* (Victor & Blackburn 1987).While it is true that it may be difficult for researchers to draw conclusions on the degree of interdependence on a larger e.g. organizational scale, the practical evaluation of the interdependencies related to a process or task is possible. The narrower scope of a process or task enables the researcher to map interdependencies between the parties involved in the execution. Thus, the definition of interdependence provided by Thompson (1967) is effectuated here, and illustrated in Figure 8.

| Pooled interdependence | Sequential interdependence | Reciprocal interdependence |
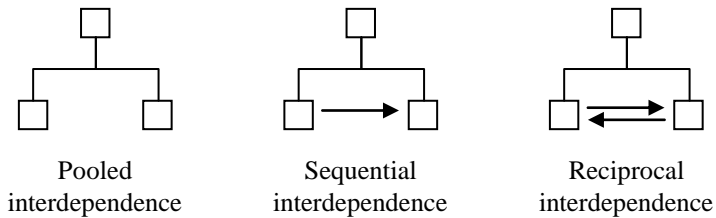
Figure 8: Illustration of interdependencies between work units.

In pooled interdependent activities there is no need for information exchange between the individuals or units. This type of interdependence demands the least amount of coordination and has an equivalently low demand for communication and proximity, since there is essentially an absence of workflow between the units (Victor & Blackburn 1987). In these instances, coordination can be achieved through standardization, rules, and procedures. The second type of interdependence is sequential. Here activity A depends on activity B, while B is not dependent on A, and the need for communication and proximity is slightly higher than pooled interdependence (medium). Coordination can be achieved through planning, scheduling and feedback. The third and final type of interdependence presented by Thomson is reciprocal interdependence, where activities A and B are mutually dependent. This demands high communication as well as proximity. Coordination through mutual adjustment is achievable through e.g. various forms of lateral linkages. Thus, managing interdependencies is a matter of understanding how different tasks are dependent on each other and based on that designing a structure facilitating the necessary flow of information.

Uncertainty

Uncertainty (e.g. Thompson 1967; Galbraith 1973) is another construct often applied when analysing tasks. Uncertainty is related to the degree to which individuals, groups or organizations have information about the future. It is multidimensional in the sense that it may concern e.g. the objectives to be pursued, tasks to be performed and the people needed to perform these tasks (Galbraith, 1973; Mintzberg, 1979). Galbraith (1974, p. 28; see also Galbraith, 1973) put forth the hypothesis that "*the greater the uncertainty of the task, the greater the amount of information that has to be processed ...*", and as a result hereof proposes different strategies to cope with uncertainty. The first set of coping strategies involves increasing the information processing capacity within the organization through vertical information systems or lateral linkages. Increasing the information processing ability through vertical information systems entails employing formal and hierarchical systems. Examples of lateral linkages are e.g. direct contact, liaison roles, task forces, project teams or committees. The second strategy set is about reducing the amount of information to be processed. This can be done by organizing into self-contained tasks or through slack resources. A self-contained

task is self-explanatory in the sense that it a set of tasks performed independently from e.g. environmental influence, and thus, subject to low uncertainty. Slack resources entail ensuring that there are surplus resources to perform a task, and thereby not having to worry about uncertainty in the future, as there is plenty of resources to cope with the uncertainty. If an organization should fail to employ one of the four strategies presented above, the alternative is to rely on formalization as well as centralized decision-making, which may overload the hierarchy with information (Galbraith 1973). As a result the quality of decision-making suffers as information is accumulated in the top of the hierarchy. Uncertainty is therefore not addressed, but left unresolved. Managing uncertainty is, thus, determining which modes of actions are applicable to implement in a given organizational structure.

Complexity

Complexity and its opposite comprehensibility (Mintzberg 1979) describes the difficulty or ease with which work can be understood. The most effective strategy towards coping with process complexity is ensuring that all necessary competences (knowledge, skills and experience) are available whenever they are needed. Thus, an approach to tackle uncertainty is to ensure the availability of sufficient competencies. Other approaches include depending on experience, intuition and guestimates. The assumption being that the "intelligence" of the organization will increase over time based on the experienced gained. This strategy is both timely and costly, as the organization needs to invest in building its knowledge-based. A different strategy is to increase the information-processing capacity through training in multiple fields e.g. both technical, commercial and leadership, thereby allowing employees to cope with uncertainty. Another variation of this approach is, simply, to hire experts (e.g. consultants or experienced employees) into the company. Increasing the size of the purchasing department can lead to higher decision quality and therefore enlarging the purchasing department is often an applied approach to reduce the perceived risk (Glock & Hochrein 2011).

Individually, the characteristics of high complexity, sequential or reciprocal interdependence and high uncertainty, respectively, all calls for a greater communication need. Divisions, functions, and individuals within the organization need to coordinate and integrate their actions. However, this is not an easy task! High complexity can promote specialization, and high interdependence requires coordination and collaborations between such specialists. In layman's terms, such situation could easily turn into a messy situation. It is therefore important that the organizational structure encompass the necessary coordination and integration mechanisms facilitating the proper channels.

The consequence of assessing the interdependence, uncertainty, and complexity of work conducted in an organization can be used as guidelines to designing a suitable organizational structure that takes into account the characteristics of the job to be

performed. The organizational structure should include coordination as well as integration mechanisms to overcome the division of labor.

2.2.1. CONTINGENCY APPROACH TO ORGANIZATIONAL DESIGN

As argued in Chapter 1 much of the changes in the nature of purchasing are responses to environmental changes. In essence, the organizational structuring of purchasing needs to align with the context in which it operates. Consequently, an approach building on the assumption that organizational structures should be designed to match contextual characteristics such as e.g. uncertainty, task interdependencies and complexity in the form of contingency theory is applied.

From the perspective of structural contingency theory, the proper organizational structure is dependent on a number of independent contingency variables. Creating a fit between the contingency variables and the internal structural variables is the essence of this approach to organizational design. Contingency theory stems from observations from Woodward stating that the firms identified as successful adapted their chosen organizational structure to fit the technical complexity of their production systems (Pugh & Hickson 2000). The core principle of contingency theory is that *there is no best* way, meaning the one can never obtain a perfect organizational structure (Donaldson 2001). Essentially, there is no best organizational structure that ensures all organizations' good performance. Likewise, there is not one specific approach to secure high performance, but a number of different structures available dependent on the context; hence, a good but not a perfect fit is achievable. Mintzberg (1979, p. 219) put forth the following two hypotheses for achieving structural effectiveness a) "*effective structuring requires a close fit between the contingency factors and the design parameters*" and b) "*effective structuring requires an internal consistency among the design parameters*". The first hypothesis bears similarities to Ashby's law of prerequisite variety, stating that as the complexity of the stakeholder environment increases, an organization must encompass a matching number and variety of internal units (Galbraith 2012). The second hypothesis entails that the internal structural characteristics must be aligned. These structural characteristics are related to how a company divides the labor, as well as the mechanisms implemented to coordinate and integrate work (Mintzberg, 1979). Derived from the works of Pugh and Hickson (2000) contingency factors, on which organizational structures dependent, include: the environment in which the organization exists (Burns & Stalker 1961), the uncertainty and diversity of the environment (Lawrence & Lorsch 1986), strategy (Chandler Jr. 1962), organizational size (Pugh et al. 1963), and technology (Woodward 1965). Mintzberg (1979) summarizes the characteristics of the surrounding environment as well as structural characteristics mentioned by other researchers of contingency theory, see Figure 9.
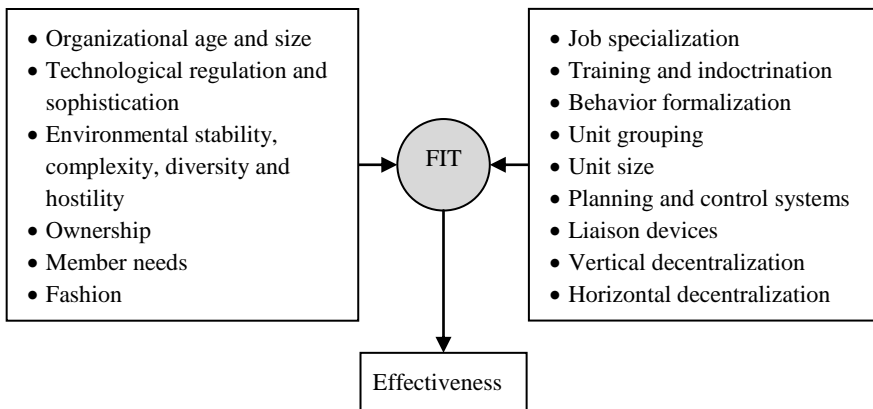
Figure 9: Structural contingency hypotheses that effective structuring requires consistency among contingency factors (left) and design parameters (right). (Based on Mintzberg 1979, p. 220 in Boer 2001, p. 11).

The premise of contingency theory is that when there is alignment between structural contingency factors and organizational structure, organizations perform better (Glock & Hochrein 2011). This extends not only to the overall organizational structures, but applies to subunits and subsidiaries as well. These subunits need to be designed to fit their individual environmental contexts as well as the constraints of corporate headquarters (Van de Ven et al. 2012).

Contingency perspective and PSM

Adopting a contingency perspective is not unheard of within the field of purchasing and supply management. For instance Flynn et al. (2010) operate under the assumption that different types of external integration moderates the relationship between internal integration and overall company performance. Glock and Hochrein (2011) conduct an review on purchasing organization and design and find that the most widely applied theoretical foundation (with five articles) is contingency theory. Another example is Bakker et al. (2008), who outline four different perspectives on purchasing organization: transaction cost theory, agency theory, resource based view, and contingency theory. From a contingency perspective uncertainty is mentioned as an important determinant of the appropriateness of an organizational design (Bakker et al. 2008). Hartmann et al. (2008) study the information processing perspective of global sourcing and argue that the effectiveness is dependent on the quality of the fit between information processing requirements and information processing capacities of the organizational design. Other examples within the PSM literature include:

- Lau et al. (1999), who study the influence of five purchasing-related factors on the structure of buying centers.

- Rozemeijer (2000), who addresses the influence of business unit homogeneity and purchasing maturity on, amongst others, the design and use of cross-functional teams.
- Johnson & Leenders (2001), who adopt a contingency perspective to study environment strategy-structure relationships at the level of the purchasing function.
- Distinguishing between service, industrial product and consumer product providers, Laios & Moschuris (2001) study the influence of enterprise type on the purchasing decision process.
- Johnson et al. (2002), who explore the effects of the structure and strategic role of the purchasing function, as well as industrial context, on the use of purchasing teams.
- Trent (2004), who investigates the association between firm size and organizational design features in purchasing and supply management.

A common denominator of the abovementioned studies is the assumption that the right fit between two sets of factors creates the more lucrative position for the organization. Accordingly, this notion will be inherent in the formulation and execution of this thesis. Thereby, it is an underlying assumption that the external environment as well as the interplay between internal organizational design features constitutes important elements in organization design. This thesis, thus, addresses organizational design with the understanding that fitting the internal organization of the purchasing task with the nature of the task results in better performance.

2.2.2. COORDINATION AND INTEGRATION

As established above, when designing an organizational structure it is helpful – if not necessary – to analyze the job to be performed and the setting in which the job is situated. Bases hereon communication and collaboration structures can be designed to support the work of an organization. Coordination and integration are both related to the interactions between divisions, functions, groups or individuals. Some scholars use the terms interchangeably and state that "... *a mechanism of coordination is any administrative tool for achieving integration among different units within an organization*" (Martinez & Jarillo 1989, p.490); while others view coordination as an antecedent to integration and argue that integration can be viewed as collaboration and interaction (Kahn & Mentzer, 1998), which are concepts related to coordination. In this thesis, coordination is viewed as aiming to create efficient work between multiple entities, whereas integration is related to creating relations and links between organizational entities. Integration is further addressed in Section 2.3. The definitions of integration provided in Section 2.3 reveal that integration is interaction and collaboration focusing at increasing the quality of the interactions between entities. Integration is, thus, on a higher abstraction level, and coordination may be viewed as intertwined with integration, as achieving coordination can lead to integration. Coordination does not necessarily

require communication, as it can be achieved through fixed sets of procedures, whereas integration is often achieved via communication. The issue is further complicated because similar practical tools can be used to achieve coordination and integration. Continuing in this thesis, an overview of first coordination and, then, integration is provided.

Coordination

Coordination is a tricky concept; it is often not noticed when it's there – but it's obvious when coordination is missing (Malone & Crowston 1994). Coordination is ambiguous in nature, as it is both a noun and a verb (Srikanth & Puranam 2011); in other words, it is a state that can be achieved as well as the actions that can be taken to achieve coordination. A simplistic definition of coordination is hard to come by, and a comparison of different definitions reveals a broad variety (Malone & Crowston 1994). A summarized definition of coordination reads:

"Coordination is managing dependencies between activities"
(Malone & Crowston 1994)

In essence, the definition results in the conclusion that if there are no interdependencies, then, there is nothing to coordinate. Elaborating hereon a coordination mechanism "… *enable*[s] *the formation and leverage of common ground without the need for direct, ongoing communication*" (Srikanth & Puranam 2011, p.850). Issues related to coordination are, thus, related to problems with aligning actions (Gulati et al. 2005). These coordination problems are a result of bounded rationality of the individuals in organizations. They do not have access to knowledge of how other interdependent divisions, individuals or functions behave (Gulati et al. 2005). There are generally two approaches to overcome a coordination need; to remove or reduce the need for coordination or to manage and accommodate the need for coordination. As it is not always possible to eliminate a coordination need by separating tasks, the most common strategy is to reduce the need for coordination by applying coordination mechanisms. Achieving coordination through planning and feedback are two often applied strategies (Perrow 1967). Coordination by planning is programmed interaction defined by rules, and coordination by feedback is negotiated sequences of the tasks between two organizational entities (Perrow 1967).

Coordination mechanisms

Mintzberg (1979) presents a continuum of coordination mechanisms ranging from horizontally centralized to horizontally decentralized. The prefix horizontally refers

to the degree to which non-managers control decision-making (Mintzberg 1979, p. 198). In other words, how diversified decision-making authority is. Figure 10 is a representation of this continuum, and it illustrates how a horizontally centralized and specialized organization may rely on coordination mechanisms such as direct supervision because one entrepreneurial owner/manager makes all decision centrally. On the other hand, horizontally decentral organizations can employ mutual adjustment, as non-managers are involved in the decision-making process and thus, can negotiate amongst themselves.

Horizontally Centralized				Horizontally Decentralized
♦	♦	♦	♦	♦
Direct supervision	Standard-ization of work processes	Standard-ization of outputs	Standard-ization of skills	Mutual adjustment

Direct supervision	Entails having one person issue work instructions to several other individuals with interdependent work.
Standardization of work processes	Entails specifying the work processes to be conducted, and thereby ensuring coordination between interrelated tasks.
Standardization of outputs	Entails specifying the results of different work. Focus is not on how the tasks are perform, but the output must be of a certain character to fit as input for another process.
Standardization of skills	Entails that different tasks become coordinated due to the related training the workers have received.
Mutual adjustment	Entails that coordination is achieved through informal communication.

Figure 10: Continuum of horizontal decentralization, Based on Mintzberg (1979, p. 198) and (Mintzberg et al. 2003).

Specifically referring to a purchasing context, research by Matthyssens and Faes (1997 referred in Hartmann et al. 2007) specifies four approaches to achieving coordination within purchasing. They are related to whether the organizational structure should be centralized and, respectively, decentralized (Hartmann et al. 2007). The work focuses on which organizational entity should have the responsibility for coordinating the purchasing tasks. However, the specific coordination mechanisms to be deployed are not addressed. Hence, the generic mechanisms proposed by Mintzberg (1979) are still considered to provide useful insights applicable in a purchasing context.

Going forward in this thesis, the focus will be on integration rather than coordination. Within the context of purchasing the linkages and especially the

quality of these links between purchasing personnel and the remaining organization plays a critical role in the success of the purchasing process. Thereby, the internal integration becomes especially interesting to address, as it deals with these cross-functional links. The concept of (internal) integration in a purchasing perspective is outlined in the next section.

2.3. INTEGRATION

Two main domains related to integration exist, one is internal and the other is external integration. The concepts of internal integration between in-house departments and external integration with mainly suppliers but also customers are undoubtedly interlinked, and they affect each other (Horn et al. 2014). Flynn et al. (2010) found that while internal integration is an important contributor to improving performance, then internal integration is still not recognized as part of supply chain integration. Some scholars also find that internal integration influences external integration (Flynn et al. 2010; Zhao et al. 2011), while others settle for acknowledging that a relation exists between the two constructs (Horn et al. 2014; Germain & Iyer 2006). Germain & Iyer (2006) summarize these varying perspectives into four overall models concerning the linkages between internal integration, external integration and performance, respectively. For the purpose of this thesis internal integration is viewed as a positive influence on external integration. Thus, the interactive model proposed by Germain & Iyer (2006) is adopted as internal and external integration are perceived to influence one another.

The concept of integration is receiving increased attention, as the speed with which information may be shared is rapidly increasing due to technological evolution (Ghoshal & Gratton 2002); thus, providing organizations with new approaches to integration. While a general applicable definition of integration has yet to be agreed upon (Pagell 2004; Kahn & Mentzer 1996), the recognition of benefits of integration as well as research into the concept of integration seem sound. Yet a research agenda on *how* to obtain integration is still needed (Chen et al. 2009).

The goal of internal integration is to unify objectives and actions related to departments and internal processes (Germain & Iyer 2006). Referring back to the contingency perspective, then achieving an appropriate fit between the organizational structure and integration positively influences functional as well as overall company performance (Flynn et al. 2010). The correct fit insinuates that high integration is not necessary desirable; rather the best performance is obtained when suitable integration levels are achieved. Researchers have established multiple performance effects of integration in a purchasing and supply setting, both in relation to internal integration and integration with suppliers or customers. The range of performance effects is broad (Ellegaard & Koch 2012) and include positive influence on e.g. savings, quality, speed related to manufacturing, delivery and customer satisfaction (Ellegaard & Koch 2012). Internal integration, specifically, is

found to be positively related to operational performance such as time, quality and cost, business performance e.g. improved product innovation or operational performance (Flynn et al. 2010; Germain & Iyer 2006; Droge et al. 2004), as well as logistics performance (Germain & Iyer 2006).

Internal integration can be addressed from different perspectives e.g. strategy, process, technology and organization (Paashuis and Boer, 1997). Integration by organization entails implementation of appropriate organizational measures taken to manage the division of labor. These measures may both be formal and informal, permanent or more temporary, as well as structural and cultural (Paashuis and Boer, 1997). Process and technology integration are associated with information processing tools and actual technologies. Continuing, the addressed aspects of integration correlate to all aspects of integration that are applicable in the studied sourcing settings. Taking an internal perspective, the term *integration* is, following the approach of Lawrence and Lorsch (1984, p. 11), used to describe the state of interdepartmental relations, the process to achieve this state as well as the organizational mechanisms deployed to attain the state. Integration is defined as:

> *"... a process of interaction and collaboration in which manufacturing, purchasing, and logistics work together in a cooperative manner to arrive at mutually acceptable outcomes for their organization"*
> (Pagell 2004, p.460)

Or in the words of classic theorists Lawrence and Lorsch:

> *"... the quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment"*
> (Lawrence and Lorsch, 1984, p. 11)

Securing integration within an organizational context relates to the creation of alignment within an organization, and in this perspective then "[p]*rocess integration refers to the management of various sets of activities that aims at seamlessly linking relevant business processes within ... firms and eliminating duplicate or unnecessary parts of the processes…*" (Chen et al. 2009, p.66). Furthermore, Chen et al. (2009) argue that integration may be understood from a connectivity and simplification perspective. Integration as connectivity concerns the

ease of transaction flow and linkages between functional departments. Secondly, simplification relates to removing redundancy and duplicating procedures. Internal integration then also consists of appropriate formal and informal incentives (Gulati et al. 2005), promoting both alignment of interests and alignment of actions between organizational sub-units. Other perspectives may be taken, for example integration as interaction or collaboration (Kahn & Mentzer 1998; Bals et al. 2009). Relating to the four areas of action to achieve integration presented by Ghoshal and Gratton (2002), then operational and intellectual integration may be related to the interaction perspective and social and emotional integration to the collaboration perspective. Other scholars may address integration, collaboration and coordination as separate constructs (Chen et al., 2009). This separation into an interaction and collaboration perspective is furthermore reflected in the definition stated by Pagell (2004), which includes both the process of interaction and collaboration. In the further discussion in this thesis, this discussion of the constructs is abandoned and interaction or collaboration should merely be viewed as describing two different aspects of integration.

Taking an **interaction** perspective on integration refers to the interactions between the parties wishing to integrate. These interactions can at large be characterized as communications (e.g. in the form of formalization and fixed processes) and information sharing practices (e.g. technological infrastructures). Interactions are non-emotional interactions that may have a schedule as well as be promoted by management (Kahn & Mentzer, 1998). Examples are: meetings, committees, standard documentation etc. In its extreme form the interaction perspective may result in sub-optimization where departments only share information through well-defined, fixed interactions. Adopting a **collaboration** perspective on integration, which is reflected in the definition of integration provided by Lawrence and Lorsch (1984), relates to working together, sharing resources and creating a common vision towards achieving mutual goals (Kahn and Mentzer, 1998). Even though mechanisms are set-up to support the organizational hierarchy "*...there is considerable evidence that many organizational systems develop integrative devices in addition to the conventional hierarchy*" (Lawrence & Lorsch 1967, p. 12).

For the purposes of this thesis, these two perspectives are merged to constitute a single, but multidimensional construct including both interactive and collaborative elements of integration. In this composite perspective (Kahn and Mentzer, 1998), integration is understood as constituted by multiple integration mechanisms, which can be either interactive or collaborative in nature. Such an approach is also taken by e.g. Förstl et al. (2013) and Pagell (2004). Adopting a composite view allows for a holistic perspective on internal integration reflecting the array of different practices that may be deployed within an organization to obtain internal integration. However, the composite view also requires a clear operationalization of what constitutes internal integration, and as a consequence hereof, how internal integration practices are identified. The focus of this thesis is on internal integration

between functional departments, their members and managers. How organizational entities such as divisions and departments as well as individuals within adopt practices to create integration is the main focus.

2.3.1. PURCHASING INTEGRATION

Within PSM the focus is often on purchasing integration – a variety of internal integration focusing on the integration of purchasing practices with the remaining organization (Narasimhan & Das 2001; Driedonks et al. 2014). Some researchers (e.g. Dubois & Wynstra 2005) include external elements (supply or value chain integration) when linking purchasing and integration. However, in this doctoral thesis only internal elements are addressed. How the purchasing function interacts with other departments has implications for the organization of boundary spanning purchasing and sourcing processes (Bakker et al. 2008; Van Weele & Rozemeijer 1996). Lack of integration may prevent the purchasing function from being boundary-spanning; and in worst case, isolate the purchasing department (Pardo et al. 2011). Purchasing integration "*enables fit and alignment between purchasing practices and the business objectives of a firm*" (Das & Narasimhan 2000, p.19). Obtaining purchasing integration becomes a task of creating alignment between the overall company plans and goals and the perspectives and actions taken by the purchasing function (Ellram & Carr 1994; Das & Narasimhan 2000). Thereby the scope of purchasing integration is broadened. It becomes a question of balancing and integrating goals and practices across the functions partaking in the sourcing process in alignment with and supporting of the overall strategic direction of company. The increased strategic recognition of purchasing's importance (Das & Narasimhan 2000; Cousins & Spekman 2003) complicates the task of achieving purchasing integration, as purchasing is included in processes traditionally placed in other functional departments. The complexity of purchasing integration is illustrated by the operationalization by Das and Narasimhan (2000). These researchers include elements such as joint goal setting, implementation of cross-functional teams and the purchasing function's involvement in product and process design, as well as in the development of sales bids (Das & Narasimhan 2000).

Researchers have established multiple performance effects of integration in a purchasing and supply setting. Internal integration is found to be positively related to operational performance such as time, quality and cost as well as business performance, e.g. improved product innovation or operational performance (Flynn et al. 2010).

The purchasing function's integration with new product development is broadly studied by researchers in PSM (Moses & Åhlström 2008). While Schiele (2010) makes the remark that it is still unclear how to maximize the contribution of purchasing to new product development, there is a general consensus that

integrating purchasing into product and process design is fruitful, as purchasing holds knowledge about the offerings and capabilities of suppliers.

In discussions of purchasing integration, the dominant perspective often concerns how other organizational entities should incorporate the perspectives of purchasing into their daily work and strategic dispositions. Taking such one-sided, unbalanced approach is not ideal. Instead, priorities of other departments should be incorporated into compromises rather than discarded. Consequently purchasing integration is evaluated as high, if the participating departments all express that they reach consensus in regards to the sourcing process. One approach to evaluating the level of integration is to evaluate the amount of integration mechanisms adopted as well as the quality of these implemented mechanisms (see 2.3.3).

2.3.2. DIFFERENTIATION

The concept of integration is related to *differentiation*. There is a duality between integration and differentiation related to a wide variety of topics (Kretschmer & Puranam 2008), e.g. interdepartmental collaboration (Dougherty 2001), multinational corporations (Ghoshal & Nohria 1989; Nohria & Ghoshal 1994) and organizational ambidexterity (Jansen et al. 2009). Differentiation is, thus, a central concept in regards to organization. In relation to the focus on internal integration – and in particular purchasing integration as addressed in this thesis – differentiation is often related to departmentalization. Hence, once work or tasks reaches a high level of complexity, it should be separated into simpler tasks e.g. by departmentalization (Galbraith 1995 in Dougherty 2001). The aim of departmentalization is to specify when and how employees should react to and interact with each other. These departments are interdependent and each contribute separately to the overall value-creation of the company (Dougherty 2001; Thompson 1967). Different segments of an organization may, thus, be differentiated to fit different contexts (Ghoshal & Nohria 1989).

Following the definition by Lawrence and Lorsch (1967, pp. 3–4) differentiation is "*the state of segmentation of the organizational system into subsystems, each of which tends to develop particular attributes in relation to the requirements posed by its relevant external environment ...* [and it] *includes the behavioral attributes of members of organizational subsystems*". While Lawrence and Lorsch has a narrow focus on functional departments cf. "*the difference in cognitive and emotional orientation among managers in different functional departments*" (Lawrence & Lorsch 1986, p.11); differentiation is perceived by other scholars on a broader scale. An organization may be differentiated by e.g. business unit, product platform or organizational process (Dougherty 2001). In essence, differentiation relates to division of labor owing to the subsystems' specialized attributes. Divisions and subunits may adopt specialized behavior matching its specific tasks and environments (Dougherty 2001). Differentiation is, thus, the (sometime

undesirable) consequences of assigning employees to functional departments resulting in adaptations to specialization in assignments and organizational heterogeneity (Kretschmer & Puranam 2008). Differentiation is also the differentiated availability of resources, capabilities, and knowledge (Foss et al. 2014). It consists of both structural and behavioral approaches to adapt to the environment (Gulati et al. 2005; Lawrence & Lorsch 1967; 1986).

From a cultural perspective, differentiation entails that culture in an organization is constituted by multiple distinct sub-cultures between which there may be interdependencies, harmony and/or conflict (Martin 2015). Cognitive and emotional differentiation may influence the ease with which coordination can be achieved (Dougherty 2001; Gulati et al. 2005), as communication between differentiated entities most likely is less effective because the affected employees do not realize the need for communication across entities (Kretschmer & Puranam 2008). Overcoming differentiation becomes a question of balancing organizational entities' need to specialize, with the overall desire to align and integrate organizational goals. This must be done not only on an organizational level, but also in respect to having the individual employees accepting and understanding the perspectives of their co-workers in other entities.

Integration and differentiation

The duality between differentiation and integration is evident and long accepted in organization science (Gulati et al. 2005; Terjesen et al. 2012), as organizations need to encompass both differentiation in the form of separation of activities and integration in terms of routines and processes (Lawrence & Lorsch 1967). While some view differentiation and integration as a trade-off, others take departure in the view represented by Lawrence and Lorsch and argue that differentiation and integration should be balanced within an organization (Terjesen et al. 2012). In layman's terms, differentiation represents a threshold that integration initiatives must overcome to achieve performance levels higher than those achieved when the interdependencies are ignored (Kretschmer & Puranam 2008).

Taking a contingency perspective; finding the optimal balance between differentiation and integration positively influences a company's performance (Terjesen et al. 2012). The degree as well as the various practical ramifications of the integration-differentiation duality within an organization has become determinants of designing subunits to fit environmental contingencies (Gulati et al. 2005). Das et al. (2006) ask the question: how much integration is optimal? The easy answer would be: whatever level of integration match the desired level of differentiation.

The task of aligning the two constructs is not easy, as high levels of differentiation may pose a barrier for integration between functional departments. Conflicts may arise if members or managers in different subsystems of an organization have unaligned perceptions of the importance, time frame etc. of any given task − in

essence, a lack of common ground and a shared knowledge-base decreases the effectiveness with which collaboration occurs between subunits (Camerer and Knez 1996, pp. 102–105 in Kretschmer & Puranam 2008). The cross-functional communication suffers due to non-existing language to convey the points. Thus, whilst cross-unit collaboration is valuable to a differentiated organization, it is also difficult to obtain (Kretschmer & Puranam 2008), and it becomes particular important to manage the internal and cross-functional interdependencies.

Differentiation between departments is not necessarily something to be avoided. A differentiated structure allows organizations to react swiftly to changes in the market due to the relatively shorter distance between decision-making authority and the environment. Differentiation between departments may allow ambidextrous organizations to pursue different exploration and exploitation strategies in separate business units (Jansen et al. 2009). Differentiation generates organizational diversity (Gulati et al. 2005) and a contingency-based notion of differentiated fit is one approach to effectively manage intra-organizational relations (Nohria & Ghoshal 1994; Ghoshal & Nohria 1989). Examples of contingent factors are environmental complexity and available resources (Nohria & Ghoshal 1994). Issues arise when managers try to apply one overall strategy, when in fact they hold a portfolio of differentiated units, which should be addressed individually (Höök et al. 2015).

While the existence of differentiation is not questioned, the wide spectrum of applications makes a common consensus on how to identify differentiation difficult. Differentiation has been empirically assessed using measures related to the degree of formal structures, and the interpersonal orientation, time orientation and goal orientation, respectively, of employees (Lawrence & Lorsch 1986). Following this tradition, differentiation is operationalized into eight items by Gulati et al. (2005); speed of decision making, flexibility, information systems, time horizon, formalization, bureaucratization, employee benefits, and pay scales. The quantification of the concept provides a noteworthy challenge as differentiation is defined as reliant on cognitive and emotional perceptions of the employees. A qualitative approach, e.g. interviews, would allow for respondents to further enrich a dataset as it could include their perceptions and worldviews.

2.3.3. INTEGRATION MECHANISMS

Originating in the contingency perspective, achieving integration cannot be viewed as one-size-fits-all because a number of factors influence the level of integration. Facilitating integration is, thus, a matter of adapting to the situation at hand by utilizing suitable integration mechanisms. An integration mechanism, sometimes denoted a mode of integration (Sherman et al. 2005), is a managerial tool used to achieve integration (Trautmann et al. 2009). Integration mechanisms are applied to facilitate strategic coherence and knowledge transfers amongst structurally

differentiated units (Burgers et al. 2009). These integration mechanisms may be interactive or collaborative in nature. The total sum of these mechanisms constitutes the level of integration. Several integration mechanisms are, therefore, in play simultaneously and interact with and influence each other. Viewing integration as the total sum of multiple subcomponents is by no means a new approach. For instance, it is seen that Lawrence and Lorsch (1967; 1986) use several items to estimate a single measure of the integration level (Gulati et al. 2005). A wide variety of integration mechanisms are mentioned in the literature, e.g. related to organization in terms of centralization, formalization and procedures, information systems, teams (both cross-functional and single functionality), collaborative incentives, liaisons, relocation and employee movements (Trautmann et al. 2009; Kretschmer & Puranam 2008; Leenders & Wierenga 2002; Ghoshal & Gratton 2002; Pinto et al. 1993; Sherman et al. 2005). An approach to determine the presence and quality of an implementation of a certain integration mechanism is to ask members of the organization for their individual evaluation of the condition of the interdepartmental relations (Lawrence & Lorsch 1967). Such method allows the capture of more collaborative integration mechanisms, as members of the organization are allowed to express their interpretations. While the appropriateness of certain integration mechanisms are context dependent; there is a general consensus that integrated companies hold certain characteristics (Ellegaard & Koch 2012). Five categorizations of integration mechanisms are proposed. While the specific notion of integration mechanism may not be mentioned in the original papers, this section outlines an overview of different approaches to achieving integration found in the literature. The list is not exhaustive, but merely an outline of different integration mechanisms, see Table 5.

Table 5: Categorization of integration mechanisms

Category	Examples of related integration mechanisms	References
Cross-functional teams	Cross-functional teams, ad-hoc committees	Carter et al. 2000; Chen et al. 2009; Driedonks et al. 2010; Ellram & Pearson 1993; Englyst et al. 2008; Enz & Lambert 2012; Johnson et al. 1998; Johnson et al. 2002; Johnson & Leenders 2006; Johnson et al. 2014; Murphy & Heberling 1996; Rozemeijer 2000; Trent 1996; Trent 2004
Physical interaction	Co-location, close proximity, relocation of employees, liaison personnel, job rotation	Baiden et al. 2006; Fayard & Weeks 2007; Ghoshal & Gratton 2002; Pagell 2004

Table 5: Categorization of integration mechanisms (continued)

Category	Examples of related integration mechanisms	References
Communication forums	Committees, meetings, joint planning, phone calls, joint decision making	Baiden et al. 2006; Bals et al. 2009; Chen et al. 2009; Das & Narasimhan 2000; Flynn et al. 2010; Kahn & Mentzer 1996; Paulraj et al. 2006; Sherman et al. 2005
Data and information sharing	ERP systems and technologies.	Baiden et al. 2006; Carr & Kaynak, 2007; Chen et al. 2009; Flynn et al. 2010; Ghoshal & Gratton 2002; Kahn & Mentzer 1996; Trautmann et al. 2009
Performance indicators	Performance indicators, goals, measures, incentives and rewards.	Driedonks et al. 2010; Englyst et al. 2008; Giunipero & Vogt 1997; Moses & Åhlström 2008a; Murphy & Heberling 1996; Paulraj et al. 2006; Trent 1998.

These integration mechanisms are outlined further in the following sections. The concept of team usage is widely applied within sourcing organizations, and it is often viewed as a direct prerequisite for implementing category management. Therefore, the concept of teams is presented in Section 2.3.4.

Physical interaction

Overall, these integration mechanisms are related to the physical interactions between individuals. Thus, the situations where miscellaneous communication is handled face-to-face. From the construction industry we know that co-location of multiple functions is a prerequisite for denoting a team 'fully integrated' (Baiden et al. 2006). A less elaborate variety of co-location is **close proximity** between the stakeholders. This allows individuals to interact through formal as well as informal channels; for instance through water cooler talk or photocopier conversations (e.g. Fayard & Weeks 2007), and other such interactions facilitated by the physical proximity. When elaborating on physical interactions between participants in the sourcing process, then **co-location** is one of the most tangible integration mechanisms. However, some argue that the relocation of employees to ensure integration is becoming less efficient, as information technologies allow for swift dissemination of knowledge (Ghoshal & Gratton 2002). While the use of **liaison personnel** does not require physical interaction, as such, it is evident in both case of company Alpha and company Beta that in practice, the unofficial integrators used a close physical proximity to their advantage. Likewise, it may be argued that the integration mechanism of job rotation (Pagell 2004) is not necessarily related to the physical placement of stakeholders; however, it refers to someone stepping into the job of another function. Also, in practice, many companies organize floor plans

related to functionality; thus, rotating into another function would often entail a change in scenery.

Communication forums

Communication is a cornerstone in integration. Communication has many elements. One is purchasing being invited to the table and involved in decision-making by participating in product design, process design, and developing sales bids (Das & Narasimhan 2000). Other aspects are regular attendance at **meetings**, e.g. strategy meetings (Das & Narasimhan 2000) or simply general meetings between departments (Kahn & Mentzer 1996). Dissemination of information in a timely manner (Chen et al. 2009) both through communication and information technology is, furthermore, an element of internal integration. Part of achieving internal integration is the utilization of periodic interdepartmental meetings (Flynn et al. 2010); and there is therefore a horizontal aspect to communication like e.g. that facilitated by cross-functional teams. However, more lateral and hierarchical communication practices are also part of achieving integration. Participation in problem definition is applied as an element of integration (Sherman et al. 2005). In essence, these communication forums are verbal as well as documented information exchanges, which are tangible and may therefore be monitored (Kahn & Mentzer 1996). Integration mechanisms related to communication are often interactive in nature. Communication may be through **committees**, **email**, **exchange of various standard documents** and **common standards**, **meetings**, **joint planning** and **joint decision-making**, **phone conversations, phone mail** and **teleconferencing** (Bals et al. 2009; Flynn et al. 2010; Kahn & Mentzer 1996; Paulraj et al. 2006; Chen et al. 2009) aiming to ensure straightforward links between internal processes (Chen et al. 2009). In line with communication forums is the concept of a no-blame culture, which is argued to create the proper setting in which stakeholders are willing to share knowledge and information with one another (Baiden et al. 2006). This is related to applying a qualitative perspective on integration mechanisms looking into not only that a) communication forums are facilitated, but also that b) they are indeed used in the intended manner.

(Technological) data and information sharing

Information sharing is often included in definitions or applications of integration (Chen et al. 2009; Ghoshal & Gratton 2002; Flynn et al. 2010). The mechanisms used to attain information integration and exchange of knowledge are therefore important influencers on how different organizational entities interact and integrate. **Technologies and software** are often used to support collaboration (Duque et al. 2012) between different departments. However, linking back to the notion of an interactive and a collaborative perspective on integration, then information flow is associated with the former (Kahn & Mentzer 1996). In relation to the flow of information, Carr & Kaynak (2007) identified a significant relation between information sharing within departments and information sharing between

departments. Integration is dependent on a work-setting allowing free exchange of information (Baiden et al. 2006) and data integration among internal functions is part of internal integration (Flynn et al. 2010).

The use of information systems (Trautmann et al. 2009) is prevalent in many companies through **enterprise resource planning (ERP) systems** or the like. The emergence of the Internet has significantly increased the information processing capabilities of many companies, and this allows them to address "*integration needs in ways that were unavailable even five years ago. Meanwhile, some previous integration tools have become less significant: staff relocation and structured career paths, for example*" (Ghoshal & Gratton 2002, p.32). In addition to technological information sharing, the usage of cross-functional teams also provide an opportunity to share information (Das et al. 2006). However, for the purpose of categorising integration mechanisms into manageable entities, information exchange is limited to technological founded mechanisms.

While sharing knowledge is often perceived to increase integration, it is worth noticing that after a certain point in time, consumption related knowledge sharing may be ineffective and wasteful (Majchrzak et al. 2012).

Performance indicators

The final set of integration mechanisms are related **performance indicators** and measures. More specifically the alignment of such performance measure across the different departments partaking in the sourcing process. Performance management – especially the alignment of performance indicators – is often considered a determinant of sourcing team success (Englyst et al. 2008; Giunipero & Vogt 1997; Murphy & Heberling 1996; Trent 1998; Moses & Åhlström 2008a). Team success may be challenged due to misalignment between team goals and performance measures of other organizational entities (Englyst et al. 2008). In addition, misalignment may also occur internally in a team if the members are driven by the goals of their respective departments (Moses & Åhlström 2008a). Furthermore, incentives and rewards are important influencers on the behavior of employees (Leenders & Wierenga 2002). The lack of a team perspective within a cross-functional team may result in lower incentive amongst members (Driedonks et al. 2010; Englyst et al. 2008). The performance of purchasing should be measured on its contribution to overall company performance (Paulraj et al. 2006), and formulating performance measures, thus, becomes an important influence on the integration achieved.

2.3.4. TEAMS

Today, purchasing is increasingly being viewed as cross-functional and is often associated with the use of teams (Driedonks et al. 2010; Englyst et al. 2008; Moses

& Åhlström 2008b; Trent & Monczka 1994). These practical implications reported in the literature as well as the observations of the case companies constituting the empirical basis for this thesis make up the reasoning behind further elaboration of teams as an integration mechanism.

One way of meeting the need for purchasing integration has been to create sourcing teams (Chen et al. 2009; Das & Narasimhan 2000). The use of especially cross-functional sourcing teams is still one of the most popular ways of organizing within purchasing (Trent 2004; Ellram & Pearson 1993). Today there is a general consensus that the use of cross-functional teams is an important contributor to achieving integration (Driedonks et al. 2010; Englyst et al. 2008; Murphy & Heberling 1996; Paulraj et al. 2006; Sherman et al. 2005). Purchasing's increased strategic role is found to positively influence the use of internal teams (Johnson et al. 2002). When purchasing is perceived as strategic, then especially teams focusing on integrating internal stakeholders with suppliers is applied (Johnson et al. 2002). Applying cross-functional teams is also argued to promote value co-creation amongst the participating parties (Enz & Lambert 2012). It also enables the merging of knowledge and resources required to respond to new purchasing demands (Trent 1996) – if executed properly that is. The increasing trend of utilizing cross-functional sourcing teams can also be partly credited to the emergence of category management as outlined above in Section 2.1.4, as the team structure is often associated with a given category of goods.

There is, thus, multiple factors promoting the popularity of sourcing teams. The purpose of implementing cross-functional teams is to improve the coordination amongst functional departments with separate goals and perspectives by merging knowledge and resources necessary to coordinate the purchasing task and/or purchase pooling (Heikkilä & Kaipia 2009). The use of cross-functional teams is also known from process improvement and new product development (Flynn et al. 2010) as an important element of an integrated process. Implementation of cross-functional teams is accredited with achieving and positively influencing the level of purchasing integration (Das & Narasimhan 2000). From a collaboration-perspective teamwork and shared goals between departments is integration (Kahn & Mentzer 1996). Teams are preferred means of achieving integration, as team can combine the skills and resources of multiple participants towards a specific task or goal (Johnson & Leenders 2006). In a matrix structure "*cross-functional teams work horizontally to break down barriers and co-ordinate across departments*" (Rozemeijer 2000a, p.59). A team, thus, combines skills and knowledge of individuals representing different functional or regional agendas – and allows the participating functions to share information with each other.

The implementation cross-functional sourcing teams tends to be a standard within major industrial organizations (Driedonks et al., 2010; Trent, 2004). Implementation of teams are found to be "*a common approach to focus the skills*

and resources of multiple stakeholders on a particular task or objective…" (Johnson & Leenders 2006, p. 339) within purchasing and supply chain management.

There is numerous evidence of the importance of the sourcing team trend within the PSM literature. Carter et al. (2000) predict in their ten-year forecast that the future of strategic purchasing will have the formation of cross-functional teams as a key activity. And the use of cross-functional teams is almost equal in frequency within service and manufacturing firms (Johnson et al. 1998). Cross-organizational teams are, thus, an accepted practice in supply chain management (Helfert and Vith 1999 in Paulraj et al. 2006), and cross-functional teams are also part of an integrated customer order fulfillment process (Flynn et al. 2010). Even in the context of product development the purchasing function is suggested to have the integrative role in the team (Murphy & Heberling 1996). Comparing results from a 1995 and 2003 survey, there was an increase in the use of i.a. mono-functional commodity teams as well as cross-functional teams (Johnson & Leenders 2006). Analysis of double respondent groups from 1995 and 2011 shows that the usage of seven out of nine types of supply related teams has increased in the period (Johnson et al. 2014).

Sourcing teams characteristics

The average sourcing team is reported to have 6.7 members representing four functional areas (Trent & Monczka 1994). Cross-functional sourcing teams are usually composed of members from departments such as: purchasing, new product development, marketing, production, logistics, and finance (McWilliams et al. 1992; Van Weele & Rozemeijer 1996; Driedonks et al. 2010). While most cross-functional teams are permanent, they may also be ad-hoc committees (Germain & Iyer 2006). Trent (1998) presents a two-by-two matrix characterizing a team as either being full time or part time as one parameter and finite/continuous as the other, see Figure 11. When sourcing teams are discussed in the literature, it is often an inherent premise that the studied teams are part-time dedicated and members need to actively balance the perspectives of the team with those of their respective functional departments. Some of the commodity teams addressed are strictly commercial and only from the purchasing department (Trent & Monczka 1998). However, still in those situations they have to account for the dispositions of the remaining organization, and cannot act independently. Thus, integration is not necessarily easily achieved even if teams are set-up, as the members of the team need to be and feel capable of integrating the multiple perspectives adopted by the individual departments. The composition of the sourcing teams should take into account that purchasing is involved in and deliver information used in other departments' decision-making (Das & Narasimhan 2000; Das et al. 2006).

Time frame

	Finite	Continuous
Full time	Members move from project to project.	Members assigned permanently to a cross-functional sourcing team with evolving or changing responsibilities.
Part time	Members support a specific team assignment or project in addition to regular job responsibilities. Team usually disbands after completing project or assignment.	Continuous support of team assignments in addition to regular responsibilities. Members most likely report to both a functional area and the team.

(Left axis label: Personal commitment)

Figure 11: Segmentation of sourcing teams (Trent 1998).

Further characterization of a given sourcing team may be done using Driedonks' (2011) typology of four archetypes, see Figure 12. While there is no mention of it in the categorization by Trent, the assumption is that the teams are permanent in nature. However, as is made clear by Driedonks, it is necessary to clarify the time perspective, as the coordination and integration task addressed in most PSM literature is ongoing and attended to on a continuous basis. Driedonks' categorization includes the aspect of cross-functionality as well as a different take on the time-frame. The sourcing teams are often presumed to be permanent in nature; however, the composition of the teams may vary over time to accommodate the changing tasks.

Cross-functionality

	No	Yes
Permanent	Permanent mono-functional sourcing teams	Permanent cross-functional sourcing teams
Project	Project-based mono-functional sourcing teams	Project-based cross-functional sourcing teams

(Left axis label: Temporal scope)

Figure 12: Typology of sourcing teams (Driedonks 2011).

The sourcing teams referred to in this research are permanent, part-time allocated and cross-functional in nature. The teams are constituted by members from at least three functions (Trent & Monczka 1994), and such cross-functional teams are argued suitable for the complex business decisions that performing and integrating the sourcing process is (Trent 1998).

Implementation of sourcing teams

While there is a general consensus that cross-functional sourcing teams are an important element of organizing for strategic purchasing; less attention is paid to the fact that implementation of these teams are far from always successful (Murphy & Heberling 1996; Rozemeijer & van Weele 2007). The way in which the implementation is conducted plays a role. Determinants for sourcing team success are addressed in literature. Core influencers are often outlined as availability of key resources, managerial support, and training in teamwork (e.g. Englyst et al. 2008; Giunipero & Pearcy 2000; Hult & Nichols Jr. 1999; Moses & Åhlström 2008b; Pearson et al. 1996). The overall organizational structure influence the ease with which cross-functional team can be implemented (Murphy & Heberling 1996). When contemplating the overall integration level achieved by sourcing teams; topics such as teamwork, unity in conception of common task and free sharing of information etc. (e.g. Kahn & Mentzer 1996; Baiden & Price 2011) must be taken into account. A fully integrated team is presumed to contribute to the overall integration level to a greater extent than a poorly integrated team. Organizing in cross-functional teams is consequently not a guarantee for instant integration – and there are different initiatives to be taken to increase the possibility of successful cross-functional sourcing team implementation.

The purchasing department and the purchaser

It comes as no surprise that the purchasing department plays an important role in the success of cross-functional teams (Murphy & Heberling 1996). On an even further detailed level, the purchaser and his or her personal characteristics, in terms of e.g. skills and personality, play a vital role. A survey amongst purchasers within the electronics industry indicated that they find themselves to have average to high access to information generated by other functional departments; however, the participation in decision-making is slightly lower (Pearson et al. 1996). This indicates that members from the purchasing department have the opportunity to improve the co-operation with the remaining organization. This matches the 1993 projection that interpersonal communication would be the most important skill within purchasing at the millennium (Kolchin and Giunipero 1993 in Giunipero & Pearcy 2000); something later confirmed as *interpersonal communication* was rated to be the most important skill followed by *ability to make decisions* and *ability to work in teams* as second and third (Giunipero & Pearcy 2000). The classical skill *negotiation* scored a fifth place out of the 30 skills investigated (Giunipero & Pearcy 2000).

Summing up, the necessary skills to be a world-class purchaser include the ability to conduct teamwork and manage change as well as internal customers by coordinating tasks and activities cross-functionally (Giunipero & Pearcy 2000). Another prerequisite for successful implementation of cross-functional teams is a change in purchasing-related mental models, both those within the purchasing department and those held by other functions (Hult & Nichols Jr. 1999). Examples of such mental models could be continuously focusing on the lowest possible price or postulating that purchasers never understand the requirements of the user (Hult & Nichols Jr. 1999).

The managerial level

Managerial support from senior managers is identified as an important enabler of cross-functional team success (McDonough 2000). The effective use of a cross-functional team is, furthermore, dependent on e.g. decision-making authority (Driedonks et al. 2014; Trent & Monczka 1994), the availability of key resources (Trent 1998; Trent & Monczka 1994), and creating company-wide standards (Germain & Iyer 2006). All of these items are characterized as being cross-functional in the sense that the department or chief purchasing officer (CPO) cannot allocate the resources without approval from other department heads. One approach to ensuring the teams' ability to progress despite of part-time allocation is to continuously evaluate the raison d'être of the team and eliminate any overlap in team tasks and departmental tasks (Trent 1998). Addressing and managing internal team conflict e.g. promoted by unaligned perception of goals is another requirement expected to be handled by management in the form of a team leader (Trent 1996). The role as team leader is essential in securing sourcing team success (Driedonks & van Weele 2009; Trent 1996). Research by Trent (1996) concludes that not involving a trained team leader promotes the risk of failure of the team. He furthermore concludes that the number one regret of companies was not paying enough attention to the skill-set of the team leaders (Trent, 1996). In addition, managerial support not only relates to the team; if purchasing in general is viewed as strategic by management then the organization is more inclined to accept teams run by purchasing (Giunipero & Vogt 1997). Managers also have the responsibility to create the right climate for the teams to exist effectively, e.g. in the form of creating structural ties (Horn et al. 2014) or motivational. The degree of ownership perceived by members is a factor influencing sourcing team effectiveness (Driedonks & van Weele 2009).

An element not further addressed in this thesis is rewards and performance indicators. However, it is mentioned in the literature that compensation of non-dedicated cross-functional teams should consider e.g. skill level, skill structure in terms of how skills are applied in team and department, and how the individual influences other members' performance (Sijun & Yuanjie 2008). It is the task of management to ensure that any performance indicators and reward systems both individual and team oriented support the cross-functional team setup. Studies

indicate that involving the team in the process of establishing performance goals will increase commitment of participating members (Trent 1996; 1998).

There are, thus, multiple challenges faced by companies implementing cross-functional sourcing teams. These hindrances should be addressed on multiple levels in the organizational structure from senior management to the purchasing department and the individual purchaser.

As outlined above, the team-based purchasing organization has received focus in recent years. While the surrounding set-up within the sourcing context has only begun to draw attention research-wise in a recent time frame; the concept of cross-functional teams is well-known in multiple disciples. Therefore, isolating cross-functional teams in a sourcing context is perhaps not the most efficient approach to ensuring successful implementation. Rather, including transferrable insights from different disciplines is the approach taken in this thesis. When trying to understand the dynamics of a sourcing team, the concept of cohesion is a useful construct, as it addresses how the interactions internally in the team, as well as externally, influences how the team is perceived by employees. The following sections address why and how cohesion may be applied in the context of cross-functional sourcing teams.

Cohesion

The concept of group cohesion is borrowed from a long standing tradition from social psychology. Here, group cohesion is understood as an explanatory factor relating to group performance and alignment. The concept of cohesion is sometimes associated with sport teams (e.g. Pescosolido & Saavedra 2012). Just like a team in sports, work teams also work towards a common goal, which allows some comparison between the two situations. One discipline that has already adopted the concept of team cohesion is new product development (e.g. Brockman et al. 2010), which indicate support of the notion that cohesion is an appropriate factor explaining sourcing team performance.

A short comment should be attached to cohesion vs. cohesiveness. The two terms are in this doctoral thesis used interchangeably, as most authors within the field of *group dynamics* do the same. Carron & Brawley (2012) state that the coherence of a group is embodied in the construct cohesion, and then present a definition covering both the terms cohesiveness and cohesion and use them interchangeably. In this thesis, the concept of cohesion will be used to cover both concepts described within the social psychology and especially the group dynamics literature. Cohesion is defined as:

> "*...the degree to which the members of a group desire to remain in the group*" (Cartwright 1968, p.91)

As briefly outlined in Lidegaard (2015), it should be noted that cohesion refers to a group of people, while PSM literature concentrates on teams. Looking further into Carron and Brawley's (2012, referring to Carron and Hausenblas, 1998, pp.13–14) perspective on a group, it is evident that a work team can also constitute a group. First, which an average of 6.7 members in a sourcing team (Trent & Monczka 1994), it is well above the required minimum of two members. As outlined above, sourcing teams do not necessarily have very formalized and structured interaction and communication; however, the choice to implement teams is the first step in setting up such procedures. Furthermore, it may be questioned if, in fact, sourcing team members feel reciprocate attraction amongst them and view themselves as a group. However, the findings in PSM literature contradicting the above are often related to failure of sourcing teams, e.g. Rozemeijer and van Weele (2007) state that teams often fail when consultants, who initiated the formation of teams, leave because the organization is not prepared to run the teams on their own. Bals et al. (2009) argue that lack of opportunity is one out of four reasons for sourcing initiatives to fail. Successful sourcing teams are, thus, deemed to have appropriate structures for communication and interaction in place. Likewise, in successful sourcing teams the members may also be argued to consider themselves a team, which is the final point in the definition of a group.

Referring back to the definition by Cartwright (1968) team members should desire to remain in the group. This applies to sourcing teams too. In practice, most managers would ensure that an open conflict between team members would be resolved or that a dysfunctional team member may be removed from the group. Thereby, the notion that members cannot (easily) leave the team should be disregarded, and cross-functional sourcing teams may be compared to the groups addressed within social dynamics and studies on cohesion. Based on these considerations, a comparison between the groups denoted in social dynamics and sourcing teams are accepted even though members of cross-functional sourcing teams cannot leave the teams they are assigned to as easily as e.g. a basketball player quieting the team.

Festinger (1950) provides an additional definition of cohesion stating that is the result of all the social forces acting on members to remain in a group. A social force is e.g., similarity among members, frequency of contact between members and the motivation of each individual member (Cartwright, 1968). Based on these different factors, the individual member assesses if (s)he finds membership of the group to be worthwhile. It is, thus, how the individual perceives the consequences of team membership that determines whether or not (s)he stays (Cartwright, 1968), and

essentially, if (s)he wishes to contribute to the performance of the group. Most research finds that there is a positive link between achieving cohesion and performance. Ehrhardt et al. (2014) found support for the hypothesis that the commitment displayed by cross-functional team members is positively related to team performance as perceived by the team manager. Likewise, Greer (2012) concluded that the positive link between team cohesion and team performance is relatively consistent over time. This positive correlation between cohesion and performance might be down to members of a cohesive group reinforcing norms on one another (Langfred 1998). While there is mainly support of a positive linkage, contradictory results exists in literature (Gully et al. 2012). In regards to cohesion in sourcing teams and performance, it is worth noticing that teams performing highly interdependent tasks have a strong correlation between cohesion and performance (Gully et al. 2012). However, it is not an easy task to create cohesion in a cross-functional team, as each team members need to create balance between the team and their respective functional departments (Ehrhardt et al. 2014 referring to Girard et al. 2007 and Denison et al. 1996).

Operationalization of cohesion

As with many social constructs, the concept of cohesion is multidimensional (Carron & Brawley 2012). Reality is that there is not a standard cohesive group (Pescosolido and Saavedra, 2012). Consequently there are – not surprisingly – several operationalizations of cohesion. For instance, Bollen and Hoyle (1990) utilize a perceived cohesion scale (PCS) allowing respondents to quantify their assessment of cohesion. While Mullen and Copper (1994), referring to Festinger (1950), argue that cohesion is a multidimensional construct covering interpersonal attraction, commitment to the task and group pride. Viewing cohesion as a multidimensional construct means accepting that a given dimension is not always present in equal amounts even in similar types of teams (Carron & Brawley 2012).

Forsyth (2006) operationalizes cohesion through three separate constructs contributing to the overall level of cohesion within a team. Attractiveness, unity and teamwork are outlined in Table 6. This framework is applied in this research because each of the three dimensions is mentioned as part of other authors' practical operationalization of cohesion.

Table 6: Constructs contributing to team cohesion.

Attraction	Attraction relates to how well group members like each other (Brown 2000; Lott & Lott 1965). In addition, group attraction is also dependent on the prestige attached to being a member of the group and if membership promotes the possibility for rewards (Festinger 1950). Thus, attraction also relates to the level of attraction group members feel towards the group itself (Forsyth 2006).
Unity	Unity relates to if group members feel bonded with each other and have a common sense of belonging (Bollen & Hoyle 1990). Cohesive groups with a high level of unity use plural pronouns like 'we' and 'us' (Cialdini et al. 1976, referred to in Forsyth 2006). Unity can emerge from attachment to as well as long-term orientation towards a group (Forsyth 2006).
Teamwork	Teamwork relates to the willingness of group members to collaborate and work with each other (Forsyth 2006). Teamwork entails that members have clearly defined jobs all contributing to the overall task of the team (Forsyth 2006). Groups with a high degree of teamwork experience a common feeling that they can achieve something with common efforts (Forsyth 2006).

Relating these constructs to the context of sourcing teams some direct linkages appears. As outlined above in Section 2.3.4, cross-functional sourcing teams requires mandate by upper management to be recognized as attractive by the remaining organization. *Attraction* is, thus, indeed relevant in the context of cross-functional sourcing teams. Sourcing team attractiveness is dependent on it being visible to the remaining organization that membership equals having decision-making capacity. In regards to *unity*, we know from PSM literature that presence of the right resources (Trent & Monczka 1994; Trent 1998) and having sourcing team members actively contributing to the overall goal of the team increase sourcing team performance. The final construct of *teamwork* can be transferred as a useful construct to a sourcing context, as it is known from PSM literature that e.g. training in both skills and attitude in topics such as teamwork positively influences the team's ability to reach its goals (Driedonks et al. 2010; Murphy & Heberling 1996; Trent & Monczka 1994).

2.3.5. EVALUATING THE LEVEL OF INTERNAL INTEGRATION

Rather than accessing internal integration like a maturity model, it is perceived as a continuum going from not integrated to fully integrated. The aim is not necessarily to achieve full integration, but to reach the equilibrium fitting a given organizational setting. Multiple studies on integration (e.g. Das & Narasimhan 2000, Pagell 2004) are survey-based and, thus, quantitative in nature. These studies mimic the complexity and multi-dimensional aspects of internal integration through

a number of different constructs. These researchers quantify the complexity of integration and build on an underlying prerequisite that the higher scores given to constructs, the more integrated the studied situation is. However, the tickbox-logic of some surveys can potentially pose a challenge, as researchers cannot control if an organization claims or even believes that it has implemented a given set of integration mechanisms and, therefore, tick these in the survey. This logic allows for no evaluation of *how* a given integration mechanism is utilized and also the quality of the implementation is left unaddressed. A quantitative approach makes it difficult to identify if in fact other unofficial integration mechanisms are in play. The combination of as well as mutual interactions between integration practices should be addressed rather than focusing on the mere presence of a practice (Das et al. 2006). Hence, the quality of integration implementation will be assessed qualitatively in this doctoral thesis, thereby allowing respondents to express in their own narrative how they experience the integration level. In addition the number of integration mechanisms as well as the quality of the implementations will be included in the assessment.

CHAPTER 3. METHODOLOGICAL APPROACH

The purpose of this chapter is to outline the research design applied in this thesis. The aim is to provide the reader with a further understanding of the reasoning behind the choices made during the design and execution of the empirical data selection, collection, and analysis.

The core methodology of the thesis is a case study research design. The nature of the research is explorative, and the aim of this thesis is to expand the existing theory within the field. Case study methodology is useful for fulfilling such purposes (Voss et al. 2002). Case studies allow for variables to be studied in a context as well as help reveal relations. Theory building or expanding case studies aim at describing key variables as well as identifying linkages between the variables (Voss et al. 2002). In addition, research aiming at building theory is particular well-suited for a case study approach, as case studies are useful when there are some uncertainty in the definition of the researched constructs (Voss et al. 2002). Building theory on the basis of case studies entails engaging in an iterative process where the researcher continuously moves back and forth between within-case and cross-case analysis (Eisenhardt 1989). Furthermore, case studies often result in "*accurate, interesting, and testable*" theory because of the rich qualitative data foundation (Eisenhardt & Graebner 2007, p. 26).

Application of case studies is not an unknown within the field of PSM. In purchasing and supply management research, 42 % of empirical studies are qualitative (Wynstra 2010). Carter and Ellram (2003) established that approx. 18 % of the studied research designs in the Journal of Supply Chain Management is based on case studies. The choice of method is, thus, accepted and recognized within the PSM research field.

Continuing, this chapter will outline the reality investigated by the researcher (ontology); how knowledge about reality can be generated (epistemology); and the method applied when investigating reality (methodology). Hereafter, the process of data selection, collection, and analysis will be outlined. Furthermore, presentations of the three cases (referred to as Alpha, Beta, and Delta) constituting the empirical background to this thesis conclude this chapter.

3.1. RESEARCH PARADIGM

Defining a research paradigm goes beyond stating which methods have been applied; it entails covering the underlying assumptions regarding how the world may be understood and interpreted. A paradigm "*represents a worldview that*

defines, for its holder, the nature of the "world," the individual's place in it, and the range of possible relationships to that world and its parts" (Guba & Lincoln 1994, p. 107). When instigating a discussion on paradigms there are often two polar opposites: subjectivism and objectivism. The two paradigms represent fundamentally different views. Where subjectivism focus on understanding (Guba & Lincoln 1994), objectivism (also denoted positivism) represents a worldview where explanations are pursued (Guba & Lincoln 1994). Finding the two stands in their purest form is seldom the case today, as most researchers recognize that either of the extremities is too caricatured. Research paradigms should be viewed as a continuum ranging from a subjectivist approach to an objectivist approach; where most recent research takes its point of origin in one of the approaches situated in-between. Figure 13 depicts the continuum presented by Morgan and Smircich (1980). The figure is not an exhaustive representation of all paradigms, but it represents the notion that paradigms can be viewed as a continuum.

	Subjectivist Approaches to Social Science					Objectivist Approaches to Social Science
Core Ontological Assumptions	Reality as a projection of human imagination	Reality as a social construction	Reality as a realm of symbolic discourse	Reality as a contextual field of information	Reality as a concrete process	Reality as a concrete structure
Assumptions About Human Nature	Man as pure spirit, consciousness, being	Man as a social constructor; the symbol creator	Man as an actor; the symbol user	Man as an information processor	Man as an adaptor	Man as a responder
Basic Epistemological Science	To obtain phenomenological insight, revelation	To understand how social reality is created	To understand patterns of symbolic discourse	To map contexts	To study systems, process, change	To construct a positivist science
Some Favored Metaphors	Transcendental	Language game, accomplishment, text	Theater, culture	Cybernetic	Organism	Machine
Research Methods	Exploration of pure subjectivity	Hermeneutics	Symbolic analysis	Contextual analysis of Gestalten	Historical analysis	Lab experiments, suerveys

Figure 13: Continuum of research paradigms (Morgan & Smircich 1980, p.492)

3.1.1. ONTOLOGICAL VIEW

Ontology refers to the thinking and various views that researchers may have on the world (Morgan & Smircich 1980). Ontological considerations concern: *what's out there to know?* (Grix 2002, p. 180). It is therefore the logical starting point of all research, as the epistemological and methodological position must follow. A definition of ontological claims is formulated by Blaike as being "*claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In short, ontological assumptions are concerned with what we believe constitutes social reality*" (Blaikie, 2000, p. 8 in Grix 2002). In an objectivistic

view, reality is viewed as being objective and as being 'out there', where as a subjectivist would argue that reality is a product of the individuals' thoughts and interpretations (Burrell & Morgan 1982). Thus, the ontological view reveals what can be known about the world. It is a prerequisite for researches to be aware of their own perception, as it has consequences for which data collection approaches are accepted and used.

3.1.2. EPISTEMOLOGICAL VIEW

Constituted by the two Greek words *episteme* (knowledge) and *logos* (reason), it may be deduced that epistemology is concerned with how knowledge can be gathered (Grix 2002). Thus, epistemology addresses how knowledge about the world can be created and obtained, in other words, what and how we know about the world (Grix 2002). Therefore the different ontological world views imply different grounds for knowledge, and thus different epistemological views (Morgan & Smircich 1980). Epistemology is furthermore a determinant for how knowledge may be disseminated to other individuals than the researcher herself (Burrell & Morgan 1982, p.1). In a subjectivistic view the aim of research is to achieve into insights and further the understanding of social realities and phenomenology; while knowledge generation in an objectivistic view focuses on explaining facts. When addressing what can be known about the world – there are two main approaches to knowledge creation; deduction and induction. The two are illustrated in Figure 14.
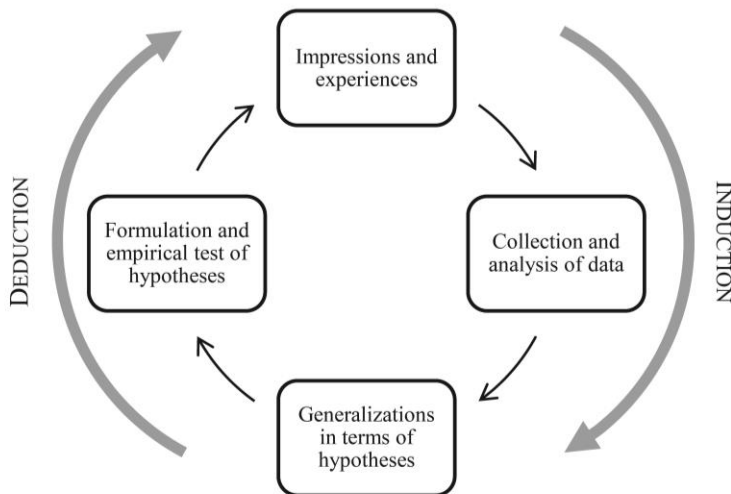

Figure 14: Induction and deduction (Maaløe 2002, p. 21).

Deduction entails formulating hypotheses based on theory and subjecting these to empirical tests. While induction is the opposite way around; formulating hypotheses on the basis of empirical observations. This doctoral thesis contains elements of both, as two conceptual papers formulated theory-based hypotheses and three empirical papers take on a more explorative approach and formulate hypotheses on the basis of the collected empirical data.

3.1.3. METHODOLOGICAL VIEW

Methodology is how knowledge about the world can be acquired (Grix 2002). The concrete research methods applied influence the precision with which one can know about the world (Grix 2002). Often an objectivistic view aims at measuring and quantifying data collection; as an opposite hereto a subjectivist approach takes qualitative approaches to explore the subjective believes of respondents.

3.1.4. APPROACH TAKEN IN THIS RESEARCH

Originating in a defined research question is the first step in building theory from case study research (Eisenhardt 1989). The research objective is not easily quantifiable; hence, there is no precise scale or measure to be applied. Rather, it is a matter of how respondents experience and perceive the situations they operate in. It is assumed that respondents are able to reflect upon their own position in e.g. a team as well as how the interactions with others and the surrounding environment influence their own perception. Hence, neither the extreme subjectivist nor objectivist approach is applied in this thesis. Although the aim is to uncover and utilize the perceptions of the respondents, the world is not viewed a constructed solely by individuals. While a strict positivistic viewpoint is not applied, it is the underlying assumption that this paradigm contains certain qualities worth aiming for. The notion that some general rules and relations can be formulated is accepted. Thereby, it makes sense for researchers to argue that e.g. formulated design rules for organizations can be transferred to other contexts besides the specific case studied. Following these viewpoints, the applied research paradigm is positioned in the middle of the continuum displayed in Figure 13. Hence, it makes sense to ask individuals in one setting, and assume that their perceptions can provide insights to a different, but similar setting. The ontological view is that reality is not independent of social actors, but there are some underlying relations that can be uncovered.

The research presented in this doctoral thesis takes a qualitative approach to investigating the topic, outlined in Section 1.3.1, because a qualitative approach matches the RPs of this thesis. Such argumentation indicates the epistemological stance taken. Overall two approaches can be taken to the researchers' role in an interview: a *traveler* constructing knowledge or a *miner* collecting data (Kvale & Brinkmann 2009). As a miner the interviewer focuses on uncovering the knowledge

held by the respondent; while a traveler experience the sites visited and forms his opinion based on the interaction with the environment he visits. Faced with these two extremities, the research at hand leans towards the miner approach, as the researchers view themselves as independent actors not influencing the reality perceived by the respondents.

Based on these observations, case study methodology is an appropriate choice for the research at hand, as this approach allows the researcher to gain an understanding of the respondents' interpretations and perceptions of their own and colleagues' behavior in the organizational context..

3.2. CASE STUDY METHODOLOGY

Case studies are utilized as they are particular relevant for answering *how-* and *why-*questions (Yin 2014). Furthermore, the research objectives of this thesis are deemed best approached by examining contemporary events. This will allow for the creation of an as-is snapshot of the situation within the studied empirical cases. These trades of non-control over behavior and focus on contemporary events are also characteristic for case studies (Yin 2014). Yin (2014) presents a two-folded definition of a case study, which he admits has evolved over the course of time. The two elements of a case study involve two parameters: the scope and features of a case study. The definition reads:

"A case study is an empirical inquiry that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident.

A case study inquiry ... benefits from the prior development of theoretical propositions to guide data collection and analysis." (Yin 2014, pp. 16–17)

In this particular instance, the case study research design is chosen as it allows for testing of and elaborating on preconceived correlations. While the relations between the variables were predicted based on existing theory; the data collection method of interviews allowed for uncovering also contradicting findings not necessarily supporting but instead elaborating on the presumed relations. Please note that these preconceptions were very fluent and vague in the sense that they predicted a relationship, but not necessarily the nature of such relationship. This matches the exploratory nature of the research at hand.

3.2.1. UNIT OF ANALYSIS

Part of conducting a solid research design is defining the unit of analysis to be studied. Wynstra (2010) found that almost 70 % of the studied cases did not specify which type of purchase was addressed. Thereby, they forgot to clarify the core of their studies. In this thesis multiple units of analysis are applied in the cases, as the participating individuals are analyzed according to two aggregations levels: at an individual level and a team/sourcing process level. The individual level is the embedded unit of analysis, as it is on a lower aggregation level than teams. Furthermore, the included papers also address different units of analysis dependent on the specific RQs that they address (see Table 7). During the course of the conducted case studies, the focuses shifted slightly from a team perspective towards a primary focus on the individual level concerning behaviors and how interactions amongst individuals influenced the integration within the three case companies.

If multiple units of analysis are applied, the case study may be denoted an embedded case study. Along with three other types, the multi-case and multi-unit design is presented in Figure 15.
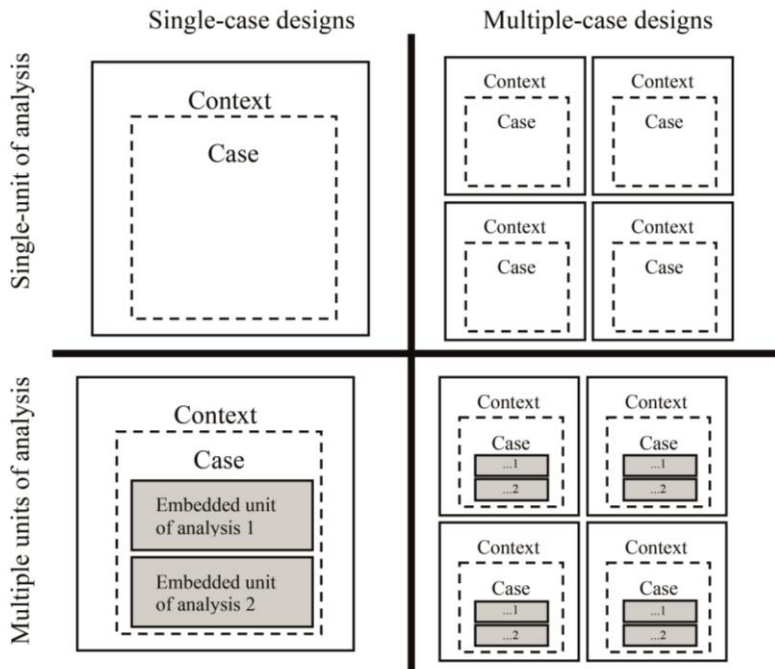

Figure 15: Four basic types of case study research design (Yin 2014, p.50).

Each of the three cases are distinct (Eisenhardt & Graebner 2007), but together they constitute the possibility to replicate or contrasts the within-case findings (Yin

2014). This approach reduces the risk of the misjudgment of a single case as well as the risk of researcher's bias (Voss et al. 2002). In cases Alpha and Delta two separate commodities are studies, whereas two separate commodities and one project team are studies in Beta. In all three cases the individuals participating in the sourcing processes are addressed as an additional unit of analysis on a different aggregation level. Referring back to the RPs of this dissertation, they concern three different aggregation levels. The first RP addresses purchasing organization, the second focuses on teams, and the scope of the third RP is integration mechanisms and behaviors. The overall applied units of analysis related to individuals and collections of individuals performing a sourcing process provide the opportunity to address shuttle differences and similarities both between and within different groups and individuals. Therefore, studying individuals as well as a higher aggregation level of teams or sourcing processes within the three cases is suitable for the research at hand.

As explained above, the phenomena studied in this thesis are addressed from multiple perspectives and, therefore, multiple units of analysis are utilized in the included papers. Table 7 outlines the unit of analysis within each of the included papers.

Table 7: Unit of analysis in the papers.

Papers	Unit of analysis
1) Organising purchasing and (strategic) sourcing: towards a typological theory	The sourcing process (conceptual paper)
2) Effectiveness of sourcing teams	Two groups of individuals participating in sourcing processes
3) The cohesiveness of sourcing teams	Sourcing teams (conceptual paper)
4) Sourcing teams and interdepartmental integration	Integration mechanisms applied
5) Coping with differentiation in project manufacturing organizations: What managers do when formal integration is not working	Behavior displayed by the individuals participating in the sourcing process

3.2.2. QUALITY IN A CASE STUDY

The following section will outline the measures taken and procedures followed to ensure that the empirical data collection of this thesis meets the demands of solid scientific work. The evaluation of the quality of research presented in this thesis is based on the four criteria for evaluating the quality of case studies presented by Guba (e.g. 1981). The usefulness of these four parameters are confirmed by Kaufmann & Denk (2011) as well as Yin (2014). The alternative criteria for establishing the trustworthiness and rigor of qualitative research are presented in Table 8. A prerequisite for evaluating the quality of a study is to present the

necessary transparency in the data analysis and consequent theory development (Kaufmann & Denk 2011). The alternative criteria for establishing the quality of a case study are applied in different phases of a case study; hence, it is not something that can be rationalized after the event. Instead, the planning and execution of the case study needs to incorporate the criteria during the execution.

Table 8: Criteria for judging qualitative research (Yin 2014, p.45; Krefting 1991, p.217; Kaufmann & Denk 2011, p. 66).

Criteria	Criteria (Yin 2014)	Case study tactic (Yin 2014)	Phase in which tactic is applied (Yin 2014)
Credibility	Internal validity	Seeking to establish a causal relationship. Note: not applicable for exploratory case studies.	Data analysis
Transferability	External validity	Defining the domain to which a study's findings can be generalized. Replication logic in multi-case studies.	Research design
Dependability	Reliability	Demonstrating that the operations of a study so the data collection procedures can be repeated with the same result.	Data collection
Confirmability	Construct validity	Identifying the correct operational measures for the concepts being studied.	Data collection

Credibility

Credibility is related to internal validity; and it is mainly a concern for explanatory case studies aiming at explaining how and why x leads to y (Yin 2014), as it is concerned with whether the collected data indeed addresses the phenomena under investigation (Guba 1981). Credibility is concerned with limiting the influence of any bias possessed by the researcher (Kaufmann & Denk 2011). Credibility may be evaluated by having respondents (the data sources) evaluate if they recognize the interpretation of the data (Guba 1981). Credibility can also be increased by conducting cross-case analysis, which should prevent the researcher from leaping to conclusions on the basis of only a single data entry (Voss et al. 2002).

Transferability

Transferability refers to the degree to which the results can be generalized to other contexts besides those studied. However, as opposed to generalizability which

builds on the assumption of an unchanging truth over time, then transferability refers to the possibility of transferring findings from one context to another (Guba 1981; Kaufmann & Denk 2011). Measures to ensure transferability are e.g. dense case description (Krefting 1991) and that external researchers via the analysis are provided with traceable correlations between the collected data and the drawn conclusions. Providing readers with such chain of evidence (Yin 2014) is argued to increase the transferability, as external parties are given the opportunity to evaluate if contexts are comparable. Furthermore, the inclusion of multiple cases will augment the transferability by reducing the risk of observer bias (Voss et al. 2002).

Dependability

Dependability is related to the reliability of the study, and it is related to accounting for the context of the research. Dependability is high if similar results are derived from a replication of the study (Kaufmann & Denk 2011). Dependability can be increased by providing the external readers of the research with dense description of research methods and conducting a code-recode procedure as well as triangulation (Krefting 1991). The dense description can be related to the use of a case study protocol as well as clarifying a clear chain of evidence throughout the study to allow traceability. The code-recode approach entails not concluding upon the results until alternative explanations for the findings have been explored as well.

Confirmability

Confirmability is taking steps to make sure that research is conducted in such way that the results can be confirmed by others. Confirmability is related to construct validity, which entails having a clear definition of the concepts studied, and on the basis hereof identifying and operationalizing appropriate measures or ways to identify the construct (Yin 2014). Triangulation can relate to multiple stages within a case study. More specifically triangulation may be related to; the data sources (data triangulation), the methods applied in data collection (methodological triangulation), the evaluators (investigator triangulation), and the perspective adopted during analysis (theory triangulation) (Patton 2002 in Yin 2014, p. 120). One approach to ensure confirmability is, thus, to utilize multiple sources of evidence (Yin 2014) and triangulating the data sources.

Quality of the empirical research

During the course of conducting the research at hand the below mentioned approaches were taken to ensure the quality of the results; by disclosing the measures taken, the reader is thought to be provided the best opportunity to judge the quality of the study.

The quality and rigor of the study presented in this dissertation was ensured through multiple approaches of triangulation. First and foremost, triangulation was addressed not through a variety of different data collection tools, but through multiple types of respondents (Yin 2014). Hence, respondents from different functions were included to enrich the dataset and avoid functional bias influencing the collected data. These measures are taken to increase confirmability by utilizing multiple sources of evidence and triangulating the data sources. Triangulation of the collected data, furthermore, ensures that the conclusions are supported through multiple perspectives and therefore increase the rigidness of the conclusions and the transferability. Investigator triangulation was ensured by the presence of more than one researcher during most interviews. However, primarily it was addressed during data analysis, where two or more researchers participated in interpreting the results. The PhD student planned and executed the analysis processes and undertook the role as main researcher with senior researchers (including the academic supervisors) as support and back-up. In other words, none of the presented findings are the result of one researchers' interpretation, but the consequence of dialog and discussion amongst the co-authors of papers. Thus, the researchers aided each other in interpreting the data to ensure that no single person's preconceived notion of the contextual situation would influence the findings of the study. Thereby increasing the confirmability and dependability of the study. Finally, theory triangulation was addressed by examining the results from multiple perspectives such as integration from the perspective of organization theory and cohesion from social psychology. Utilizing different theoretical perspective entails analyzing the data from multiple perspectives and casting new light on the interpretations of the findings. This approach reduces the risk of bias interpretation of the findings, as it forces the researchers to revise their interpretations of the data.

A third construct from the framework concerning the evaluation of case study quality (see Table 8) is credibility. It was addressed through final workshops and/or presentation given to the participating companies. During these sessions the researchers had the opportunity to validate the findings and the interpretation of the interviews with some of the respondents.

The empirical evidence presented in the thesis refers to three project-based companies in a Danish context. Although the cases are all, respectively, large entities or headquarters of multinational enterprises; the Danish context should be noted as most respondents are either Danish or situated in Denmark, which will inherently influence the cultural background of the respondents. As illustrated through the work, the project-based nature of the cases influenced the buying-situation at the companies, and following the contingency perspective, it therefore also influences the appropriate purchasing organization. Hence, before generalizing to other settings (e.g. mass manufacturing) companies need to account for differences and similarities in the contextual settings. Nevertheless, generalizations from this research are still applicable, as the situational factors in each case study

are accounted for; thus, allowing readers to judge for themselves if transferability to their context is suitable. Yin (2014) separates generalization into statistical and analytical generalizations. A statistical generalization inference about a given population is made. Analytical generalizations concern the formulation of general lessons learned, which may be transferred beyond the specific case in the form of propositions formulated to target a conceptual higher level than the specific case (Yin 2014). The findings presented in this thesis and the related papers are subject to analytical generalizability. Thereby the findings are generalized as additions to existing theory (e.g. through propositions and future research agendas). Further testing of these contributions to theory may result in generalization to a larger population at a later stage.

Test of the research protocol

Another approach taken to address the validity of the conducted case studies is the completion of a preliminary test of the research guide and interview questions. The pilot test of the case study protocol utilized in cases Beta and Delta was conducted at a fourth company and involved two respondents. The aim of this test was to exam if questions were perceived in the right way as well as how the topics of this doctoral study could be addressed by purchasers with a strategic perspective. As the pilot testing was far from full scale, the results are not included in the thesis.

The test revealed that questions needed to be diversified in accordance to whether or not respondents participate in a team or not. Furthermore, managers received adapted questions to further the understanding of the context in which the teams operated and where set.

In the case Alpha, the main data collection tool involved respondents ranking the importance and performance related to a given set of sourcing related skills and competences. This data collection approach was developed in collaboration with and tested at other companies with characteristics similar to Alpha, Beta and Delta.

3.3. DATA SELECTION

Within a case study there are six sources of evidence; documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts (Yin 2014). In this research, one main approach of data collection is applied: interviews. The qualitative data generated through the interview process are deemed appropriate for investigating the unit of analysis, as the relations in the studied group of individuals may be uncovered. Furthermore, the respondents interviewed had different functional backgrounds, which entails that the topic at hand was examined from multiple perspective beyond the scope of the purchasing function.

3.3.1. INTERVIEWS

Two types of interviews were conducted; shorter approximately one hour talks with respondents and longer or multiple talks with informants. Informants were consulted before the majority of interviews were conducted. Thus, these interviews of informants served as preparations and setting the scene; thereby, ensuring that researchers understood the context within the specific company.

The shorter one hour interview with respondents followed the case study protocol more strictly to ensure that responses where comparable. Each interview had the format of a dialogue. Hence, not all respondents were asked all questions in the case study protocol; neither were they necessarily asked in the order as they are presented in the protocol. Providing respondents with the opportunity to speak freely and elaborate on topics dear to them outweighed the consequences of deviating from the case study protocol. Since the aim was to learn about respondents' understanding, it was priorities to allow respondents as much leeway as possible to make them feel comfortable enough to entrust the researchers with their thoughts. The depth of the interviews provided the researcher with the opportunity to initiate a sort of data triangulation whilst conducting the interviews, as claims made by one respondent could be verified or discussed with other respondents. This is naturally a delicate approach, where the researcher must not put words into the mouth of respondents. Hence, claims made by other respondents were often disguised as clarifying questions rather than presented as claims made by colleagues of the respondent.

The informants were, in a similar manner, subjected to the questions in the case study protocol during their interviews; although focus was more retrospective to ensure that researchers had an informed understanding of the background and the organization at hand.

3.3.2. WORKSHOPS

Each case study was concluded with a workshop with management. The purpose of these where two folded; one objective was reporting the findings while the other related to observing the response amongst the respondents as well as being present during their initial discussion of findings. The researchers participated actively in discussions, and ensured that clarifying questions were asked to increase the understanding of why respondents took the positions and responded as they did. Thus, researchers took on the role as interviewer while actively informing the discussion with the findings of from the case study. The goal of these workshops was to validate the findings as the researchers had the opportunity to get their observations and interpretations confirmed by company representatives.

3.3.3. CASE SELECTION

A case may be chosen on the ground of being extreme or representing polar types (Eisenhardt 1989 referring to Pettigrew 1988). Hence, the goal of such theoretical sampling is to study cases that either replicate or extend emergent theory (Eisenhardt 1989). The three cases studied in this thesis are chosen because they themselves have expressed a curiosity in regards to; how cross-functional teams work and integration can be achieved in the sourcing process through their participation in the Sourcing Excellence research project. Hence, they have all expressed an interest in complying with the aim of the research and supply the necessary resources in terms of man-hours for interviews and planning. The cases all have similar characteristics; they are Danish industrial companies of a certain larger size. They are part of multinational groups (two of which have headquarters located in Germany and one in Denmark). Also, they all are primarily present in project industries and manufacturer of large non-perishable industrial commodities. The cases are shortly presented in Table 9 specifying their main domain of business and the specific areas subject for investigation.

Table 9: Selected case companies.

Case	Main domain of business	Researched Areas	Respondent characteristics
Alpha	Project-based design and partial production and full installation of sorting systems for luggage and packages.	Subcomponents to the main product assembled at Alpha. Both categories are bought in from OEM manufacturers, but one is designed at Alpha.	Two groups of individuals, each handling a specific type of commodity.
Beta	Maintenance division within a project-based global company working within renewable energy.	Two categories of electrical supplies, both important parts although available in bulk buy; and a mechanical commodity related to a physically large and costly component.	A commodity team, a group employees handling a commodity but not in a team, and a project team.
Delta	Project-based design and construction of large industrial systems. Primarily within the minerals processing industry.	Subcomponents utilised in multiple business areas within Delta. Each of them is costly and is often bough one at a time.	Two commodity teams each working with a specific commodity.

The linkage between the three cases and the papers included in this thesis is presented in Table 10. As illustrated below, the findings from case Delta will be presented in future research due to delays in the overall time frame of the third case study. The case is still addressed in this doctoral thesis as the data collection has commenced and has contributed to the learning experience of planning and executing research and empirical data collection. Further analysis of case Delta is postponed to be part of future research.

Table 10: Connections between case studies and papers.

Papers	Case
1) Organising purchasing and (strategic) sourcing: towards a typological theory	Alpha
2) Effectiveness of sourcing teams	Conceptual paper
3) The cohesiveness of sourcing teams	Conceptual paper
4) Sourcing teams and interdepartmental integration	Beta
5) Coping with differentiation in project manufacturing organizations: What managers do when formal integration is not working	Alpha and Beta
6) Future paper (not included in this thesis)	Delta and Beta

3.4. DATA COLLECTION

Data was collected through semi-structured interviews (Kvale & Brinkmann 2009), as this approach allows for the respondents to influence the structure of the interview through their answers and narratives. A semi-structured interview goes beyond the unstructured conversation but has less restrictions than the questionnaire or ranking on scales (Ellram 1996). The interviewer still has an interview guide as point of origin for the interviews. Respondents are provided the opportunity to elaborate on the matters they find relevant to address based on the topics and questions introduced by the interviewer.

A typical interview was initiated by the researcher(s) explaining the purpose of the interview and clarifying any questions respondents may have up front. Then respondents were asked to introduce themselves. The purpose of this initial question was two-folded; a) it provided insights into the background and the knowledge the respondent may have about the topic, and b) it was meant as an icebreaker as respondents would easily be able to answer the first question, which could help reduce any nervousness on their part. Hereafter, the different topics where uncovered. The cases are studied as real-time cases (Voss et al. 2002), as there are no longitudinal perspective. Respondents were therefore not asked to compare and

contrast with earlier stages. Had this been the aim of the interview, it would only have been fair to ask respondents to prepare beforehand. Despite focus on as-is, respondents were not prohibited from drawing upon retrospective considerations; but as such, the aim of the data collection is not designed to address past events. Hence, the collected data is aimed at providing an as-is illustration of the status within the groups; however, to reflect hereon, respondents were not limited from the possibility to recall previous experiences.

During the course of the data collection, it was difficult to cover topics related to integration as it is often inherent practices not necessarily noted on an everyday basis by respondents. To overcome this, respondents could be asked to walk the interviewer through a work week; *which tasks were undertaken? With whom did you interact?* etc. to initiate the conversation. The difficulty for some respondents to identify coordination and integration mechanisms influenced the interview process. The researcher had to ask multiple associated questions to ensure that the collected data indeed did relate to the topics in the research protocol. Other times, respondents would reply with conflicting answers; using statements such as: on one hand and on the other hand. However, this is also the strength of qualitative data collection, as it can reveal such considerations made by the respondents. All in all, the process of conducting interviews represented a challenge, as it is not easy to have people explain and report on abstract constructs such as coordination, integration, cohesion and performance. However, the data collection approach yielded nuanced answers and in-depth stories allowing the researcher(s) to gain an understanding of the situation within the case companies.

All interviews were recorded and in the instance of Alpha, where respondents produced a visual overview, pictures were taken. The choice to record the interviews was made before the interviews were initiated in order to secure solid documentation of the data. Respondents were informed about the recording and ensured that no recording would be shared with management or other parties. Only a small number of respondents appeared to be initially affected by the recording device; but then proceeded to forget it as the interview progressed as a two-way conversation rather than an interrogation.

A note on data collection at Alpha

For the purpose of case study Alpha, data was collected for multiple purposes; the research presented in this doctoral thesis being one. The quantitative ratings are therefore interpreted as snapshot of the reality; and any ratings are accompanied by the qualitative statements made by the respondents when used to shed light on the research at hand. During the data coding and analysis, nine interviews of the 27 interviews from case Alpha were dismissed. First of all those related to suppliers were discarded. Also, some respondents only talked about the quantitative data

collection approach without providing any further elaborations, and they were therefore excluded as well.

3.4.1. ADDRESSING BIAS DURING DATA COLLECTION

Although it was the aim of the researcher to foster an open dialogue during the interviews; it is worth noticing that there will always be an asymmetrical balance in an interview, as the researcher asks questions that the respondent answers (Kvale & Brinkmann 2009). An interview can, thus, be quite manipulative if the researcher has a hidden agenda (Kvale & Brinkmann 2009). Therefore, it is the job of the interviewer to reduce the bias introduced into the conversation.

As displayed in Table 11, the case study Delta was conducted by the PhD student, while other researchers participated in the team collecting data at Alpha and Beta. This entailed that experience in the art of interviewing was gained under the guidance of seasoned researchers throughout the first two case studies. Utilizing experienced co-interviewers is argued to heighten the quality of especially the first round of interviews.

The quality of the data collected through a case study is also dependent on avoiding bias from the researchers. Hence, to ensure bias is avoided the researcher was open to contradictory evidence not supporting the preconceived correlations.

Furthermore, the different functional backgrounds of respondents entailed another reason why bias should be addressed (Voss et al. 2002). During the interviews the researcher was very aware not to introduce logics and notions overheard in previous interviews, as this may affect the bias of the respondents and exclude the immediate thoughts of the respondents. For instance, some technical personnel expressed frustration with priorities made by commercial employees. In these instances the researchers made sure not to mention the positions and stories presented by commercial employees in previous interviews.

3.4.2. RESPONDENTS

It was a conscious decision to interview as many respondents as possible related to each commodity category, as it is believed to provide the best source of rich data (Van Weele & Van Raaij 2014). Also the use of multiple respondents with different functional backgrounds or organizational perspectives limit the risk of convergent retrospective sense-making (Eisenhardt & Graebner 2007). All respondents interviewed in Alpha were identified by executives in the different purchasing related departments. Hence, a company contact appointed two categories and then identified employees related to these commodities.

In the case of Beta and Delta respondents were contacted by the category or team managers; however, all of the respondents report to a functional manager, and as such the category manager has only functional responsibility of the work – not managerial responsibilities related to the respondents. In the case of the non-team

respondents at Beta, the managers of the team approached functional managers for their permission to interview members working with a specific commodity. As there are no managerial hierarchy between the interviewed team members in Beta and Delta, it is believed that it did not affect the collected data that team managers had initiated the contact.

The number of respondents is also relevant to address (Voss et al. 2002). The questions asked in cases Beta and Delta are of such nature that a single informant would have been inadequate. Rather, as the aim was to establish how a team or groups of individuals work together, all team members or contributors to a sourcing a product are included as possible respondents. The actual respondents were identified by the case companies themselves. In case Alpha the individuals connected to two product categories were chosen. In Beta a sourcing team and non-team, but still a group of employees working with the same commodity constituted the main respondent-base. In addition hereto a purchasing-related project team was chosen as a third reference. This team wasn't concerned with daily operations within a product category but related to transferring the sourcing task from an European site to an American location. In case Delta the respondents where the core members of two individual teams each concerned with the strategic procurement of a given commodity. These respondents were identified as core members by the team leader as these members where included in all team meetings and not drawn upon as a sort of consultants.

Table 11 lists an overview of the respondents in each of the three cases. The average length of an interview was, respectively, 50 minutes for Alpha, 70 minutes for Beta, and 54 minutes for Delta.

Table 11: Overview of the conducted case studies

Case study	# of interviews	Interviewers	Respondents	Period	Additional data
Alpha	22	N. Lidegaard (15)	Managing director	Autumn 2012	Informal conversations
	(+ 5 interviews with suppliers)	M. M. Møller (27)	Logistics director		
		L. Mikkelsen (apx 12)	Procurement director		Quantitative evaluations
		A. L. P. Hansen (15)	Operations director		
			Systems director		
			Head of project procurement		Concluding presentation
		Please note:	Head of documentation		
		The numbers in brackets	Head of procurement		
		indicate the number of	Procurement manager		
		interviews in which each	Business manager		
		researcher participated.	Logistics manager		
			Procurement assistant		
			Operational purchaser		
			Electrical project manager		
			Electrical project manager		
			Technical project manager		
			Technical project manager		
			Electrical engineer		
			Electrical engineer		
			Design engineer		
			Systems engineer		
			Team manager		

Table 11: Overview of the conducted case studies (continued)

Beta	14	M. M. Møller (8) N. Lidegaard (14)	Global commodity manager Senior buyer Senior buyer Head of operational procurement Operational buyer Operational buyer Employee from return department Engineer Engineer Global commodity manager Buyer External consultant, Engineering and specifications External consultant, Quality Production manager	Spring 2015	Introductory talks Informal conversations Concluding workshop
Delta	11	N. Lidegaard (11)	Group category manager Divisional category manager Divisional category manager Divisional category manager Group category manager Data analyst Divisional category manager Divisional/Group category manager Category manager Divisional category manager Divisional category manager	Autumn/ winter 2015 + Spring 2016	Introductory talks Presentation of digital platform Concluding presentation
Total	52	N. Lidegaard (40)			

3.5. DATA ANALYSIS

As mentioned, all interviews were recorded. This allowed the researchers to revisit the recordings repeatedly. The initial coding of the data was undertaken during the playing of the recordings as only sequences containing relevant insights into the topic of analysis at hand were transcribed. Topics were formulated in conjunction with the PhD supervisors, and the topics had an iterative nature in the sense that they were adopted during the course of the process as the data revealed new insights. Thus, data analysis was a process of multiple iterations going back and forth over the data. In addition, this iterative process was repeated several times for each perspective taken on the data. A perspective is constituted by the topics according to which the data is coded. Furthermore, as it is often the case when conducting multiple case studies, there was an overlap between data collection and data analysis (Eisenhardt 1989). This happened as analysis of the previous cases was ongoing while other case studies were conducted. This entailed that the researcher was aware of findings from case Beta, when case Delta was conducted.

Another reason for the partial transcription lies within time constraints. The transcription process is quite time consuming and requires resources beyond those available in this instance. However, to further the learning objective of the PhD study interviews from case company Beta were fully transcribed. This process yielded a further understanding of the attention to detail as well as precision the craft of analyzing qualitative data requires.

In addition to the above mentioned recordings and transcriptions, field notes were kept during interviews as an additional form of data record. These notes were particularity utilized in the formulation of the topics relevant for coding the data, as the identification of possible patterns is an often applied use of field notes (Voss et al. 2002).

3.5.1. CODING OF QUALITATIVE DATA

Following the initial first level of coding, the data underwent additional coding processes to reveal patterns across interviews and cases. The process of coding does not come easily. It can be a frustrating and even hated experience (Miles 1979). However, it is a necessary process to undergo when systematically analyzing qualitative data. Data analysis and coding is making sense of large amounts of qualitative data (Miles 1979). Coding is data reduction, and Miles (1979) explain how a relatively elaborate number of initial categories were reduced to a meaningful, limited number of major categories. Reporting on the learning from the same coding process, Miles (1979) reports that it became evident that the field workers collecting the data began developing working hypotheses during the collection phase. It was therefore important to have co-researchers challenge these

hypotheses to ensure that not only data supporting and favoring the initial analysis were included. This stresses the need to have multiple researchers involved in verifications of the findings.

Approaches to coding

There are multiple approaches to coding; a few of these are, respectively, the constant comparative method (e.g. Glaser & Strauss 1967) and more specifically axial coding (e.g. Corbin & Strauss 1990; Miles et al. 2014).

The constant comparative method was derived to provide an analytic procedure to inductive theory development (Glaser & Strauss 1967). Associated with grounded theory, the methods outline coding procedures divided into steps focusing on creating rather than testing theory (Glaser & Strauss 1967). The two initial steps are particular interesting when addressing the coding process. The first of these analytic phases includes coding the data into categories that emerge as the coding takes place. This is not a one off-experience, but the analyst need to code the data even three or four times before initial patterns begin to emerge (Glaser & Strauss 1967). In the second step the coding continues, but focus is slightly shifting. Now the aim is to merge and integrate categories with similar properties (Glaser & Strauss 1967). The third step reduces the number of categories as well, and final fourth step is the actual theory formulation (Glaser & Strauss 1967).

In line with these observations, Strauss and Corbin introduce the concept of axial coding. This particular type of coding is the second tier out of three basic types of coding; open coding, axial coding and selective coding (Corbin & Strauss 1990). The relationships between these three basic coding approaches are outlined by Ellram (1996); often open coding is used to break down, categorize and then compare and contrast data. Axial coding is applies to make preliminary connections between categories. Hence, axial coding focuses on drawing connections between categories of data derived during the open coding (Ellram 1996). Selective coding aims at formulating a cohesive theory on the basis of the coded data (Ellram 1996). Coding is, thus, an iterative process where researchers derive overall theme by altering between open coding and axial coding (Ellram 1996). Axial coding is important, as the further analysis of the data is determined based on the themes developed here (Ellram 1996); hence, it is not a step can should be quickly over with. Axial coding can, furthermore, be related to the concept of pattern coding presented by Miles et al. (2014). Pattern coding can be compared to the qualitative analysts' cluster-analysis (Miles et al. 2014). Pattern codes are exploratory in sense that it aims as combining the identified categories into meaningful meta-categories (Miles et al. 2014).

Coding of the empirical data

For the purpose of the data presented in this dissertation and its associated research papers, the coding process followed the overall steps described above. Initial coding activities were undertaken already during the interviews, as researchers' would be inspired by past interviews to ask elaborative questions in the later once.

The first, systemized step to coding the data was conducted during the partial transcription of the recorded data. The findings were evaluated together with an academic supervisor, and in conjunction the two researchers discussed possible meta-categories. Even after the first transcription, the recordings were reevaluated to ensure that all potentially relevant observations were recorded in writing before the following coding steps commenced. Hereafter, the process entailed merging the codes, as described above, to reduce the findings into overall themes. This too was an iterative process, where PhD student and supervisors discussed possible interpretations before diving back into the data to search for possible alternate explanations or interpretations. This process was repeated for each of the analyses conducted.

3.5.2. WITHIN-CASE AND CROSS-CASE ANALYSIS

Both within-case analysis and cross-case analysis is applied. Within-case analysis improves the familiarity with the data, while cross-case analysis minimizes the risk of an analysis not going past the initial impressions of the researchers, as it entails looking at the data from multiple perspectives (Eisenhardt 1989).

There is no one best way to conduct within-case analysis (Eisenhardt 1989). The process of within-case data analysis included the iterative process of coding the data. Coding of the data is central to effective case based research (Voss et al. 2002). By coding observations into categories, the researcher is left with a far better comprehensible dataset. Comparing the observations within a category allow the researcher to form an overall reflection of the category at hand.

There are two main approaches to between-case analysis; a) to select categories (e.g. based on a research objective) and then search for within-group similarities and differences or b) to select two cases and then to list all similarities and differences between them (Eisenhardt 1989).

In the research presented in this thesis, the coding was primarily recorded in a spreadsheet. Here quotes related to integration, cohesion, actions performed or perceptions were listed for each respondent. Furthermore, it is worth noting that perceived performance is subject to some bias. If managers evaluate a team's performance based on their own unrealistically high expectations, then even teams found by members and other bystanders to be performing well may be perceived as

unsuccessful by the manager. This stresses the need for concluding across categories, as isolated statements not included in a pattern can be misguiding.

The following three sections contain case descriptions of the three chosen cases. The purpose of the following narratives is to provide an overview of the cases as well as give further in-depth presentation of the case companies.

3.6. CASE STUDY: ALPHA

The first case company – here denoted Alpha – is a manufacturer of large scale automatic conveyer and luggage handling systems. Alpha was originally family owned, a culture still prevailing in the company. Most of the respondents have worked in Alpha for at least a decade and, thus, carry a lot of experience and knowledge about internal operations and the external environment. Furthermore, respondents appears to utilize the network that they constructed over time to ease their daily work.

Today Alpha is owned by a large competitor, but it still remains largely autonomous. This might be one of the reasons for respondents still operating at large as if the company is family owned. Recently Alpha has experienced a steady positive financial growth in terms of turnover as well as profit of more than 40% in the three year period prior to the case study.

3.6.1. INTEGRATION AT ALPHA

Purchasing does not have a long standing tradition as being viewed as strategic within Alpha. In fact, the recent introduction of a strategic purchasing department has entailed the first step towards increasing the internal focus on sourcing. Up until a few years before the case study was conducted purchasing was primarily viewed as a support function, and it was not uncommon that other employees would make deals with suppliers and simply ask the purchasing department to finalize the official purchasing orders. However, with the introduction of a strategic purchasing department came the attempt to enforce formalized procedures. Now all communications with suppliers must go through the purchasing department; the reasoning being that such procedure would prevent employees from other departments from drawing upon personal relations with suppliers, when choosing components for a finished product.

Integration at Alpha is low and the inter-departmental and inter-functional differentiation is high. The high differentiation is particularly evident in regards to the time and goal orientation of the respondents (Lawrence & Lorsch, 1986). In Alpha the strategic purchasing department and R&D work on long-term perspective, while the actual consumer of goods, the project division, operates on a

relatively very short time frame entailing that respondents here do not always believe they have the time to even consider consolidating purchasing across projects.

Integration initiatives mentioned by respondents at Alpha are: implementation of category teams and category management as well as co-location. However, it appears that co-location is informal in the sense that it seems to be individuals utilizing the close proximity rather than a deliberate managerial choice. Furthermore category management initiatives appear to be understood only within the purchasing functions.

3.7. CASE STUDY: BETA

Case company Beta is a service and maintenance company within a division of a very large multi-national company (MNC) with a range of different production categories. The division is in itself a global recognized producer of wind turbines. The company concluded a period of high growth in by 2014, which resulted in a 7% deficit.

The organization is used to respond to scheduled maintenance as well as ad hoc breakdowns. Hence, the organizational set-up needs to be capable of handling two polar situations on a daily basis, which entails a workforce accustomed to adjusting and handling rapid changes in their environment. Time is often a limiting factor in Beta, and the organization and its employees are aware that these ad hoc cases must be prioritized above all else. Coordination between departments is the key to solving the tasks at hand – also none ad hoc – but the links between departments is sometimes overly complicated and unofficial approaches are set in motion.

3.7.1. INTEGRATION AT BETA

Only a few integration mechanisms have been implemented, and with limited success. Some cross-functional commodity teams were originally formed, but today only one truly operates. The remaining has been discontinued due to limited resources – not due to a lack of need. The organization is described by the respondents as very much dependent on individuals and their know-how.

Beta can, therefore, be described as a case of low integration. Adding hereto is the fact that the organization is subject to high differentiation in terms of time- and goal orientation (Lawrence & Lorsch 1986). The strategic purchasing department has a long-term perspective; while especially the engineering staff often deals with ad hoc tasks. Furthermore, goals are misaligned. For instance strategic purchasing is measured on unit costs, which can be decreased by increasing batch sizes.

Meanwhile operational purchasers are measured on inventory value. Hence, the respondents at Beta express a clear case of differentiation.

3.8. CASE STUDY: DELTA

Case company Delta is an original equipment manufacturer (OEM) manufacturer within large industrial processing equipment and plants. As an MNC operating out of the headquarters in Denmark, the company has a divisionalized structure. Looking overall at the group the turnover has remained relatively steady in a three year period leading up to the study. However, the profit reached a – for the company – historic low two years prior to the study. Delta is currently undergoing a process of turnaround. This plan has led to increased focus on purchasing. None of the restructuring initiatives influenced the study at hand; expect the introduction of a divisional category manager role linking the global procurement department with the purchasers located within the respective divisions.

3.8.1. INTEGRATION AT DELTA

In regards to the applied integration, the global strategic purchasing department located at the company headquarters promotes most initiatives within strategic purchasing.

The utilization of category teams is long standing in the company, and they are all run by a manager responsible for ensuring a cohesive strategic throughout the entire group – hence, also across business areas. Although most divisions are represented within all teams, there are always one or two main divisions as they procure the largest quantity within the area. This title is not an official one, but respondents expressed that they were very much aware whether they represented a main division or not, as that characterizes the role and authority they hold in the team.

Also, each team has administrative aid from a back office function, which both the commodity manager and team members can utilize. However, in both teams studied these services are only utilized by team managers.

Company Delta is a case of somewhat low integration. The teams are working, but their place in the organizational hierarchy is questioned by participants. Also some of the participants that are by the strategic purchasing department presumed to work full-time on purchasing reveals that they, in fact, only conducts the work part-time.

CHAPTER 4. SUMMARY OF PAPERS

The five papers are enclosed in full-text version in an appendix not made publicly available in order not to infringe on publishers' copy right. The purpose of the following section presents a brief outline of the five included papers.

Paper 1 – Lidegaard, N., Boer, H. and Møller, M.M. (2015)

This conceptual paper, first and foremost, presents a literature review concerning purchasing organization. The review includes publications from 1990 to 2013 within 25 journal related to purchasing, supply chain management or organization.

It identifies the prevailing solutions suggested by existing literature to be functional departments and cross-functional teams, respectively. Both these solutions can be embedded in a centralized, decentralized or hybrid overall structure. Existing research on organization of purchasing as well as an empirical example from company Alpha furthermore reveal that although there is a general consensus on approaches to organize purchasing, companies often struggle to obtain the expected results when applying these solutions in practice. It is, thus, concluded that companies are willing to change their organizational structure to accommodate purchasing but don't necessarily know what to change into.

Drawing upon contingency theory; it is presumed that the success of the purchasing process organization is dependent on creating a fit among characteristics of, amongst others, the company's processes and organizational structure. Hence, the nature of the purchasing process must be addressed. This is done via the characteristics of uncertainty, complexity, variety and interdependence. On the basis of these process characteristics a typological theory of purchasing and (strategic) sourcing organization is formulated.

Paper 2 – Lidegaard, N., Møller, M.M. and Ellegaard, C. (2013)

Effectiveness of sourcing teams

Work-in-progress paper presented at the 20th EurOMA Conference, Dublin, Ireland

Keywords: Sourcing team, team alignment, team performance

Outlining two cases related to each their commodity within a single company, this paper proposes a possible explanation for the different levels of success experienced by similar organized commodities. Within one setting there is no alignment between the perceptions of importance made by three functional groupings (R&D, purchasing and management) working within a given commodity. In the other instance, total alignment was present in four out of 10 areas.

The paper discusses the possibility that the degree of in-house knowledge concerning the sourced commodity can constitute an explanatory factor influencing how internal alignment may be achieved. Hence, the working hypothesis within the discussion of this paper is that the different sourcing tasks within a single company need to be organized according their own characteristics. One such characteristic is proposed to be the degree of in-house knowledge.

Six archetypes concerning the level of in-house knowledge are proposed. It combines two existing models, namely Asanuma´s classification of components and suppliers and Fine and Whitney´s model focusing on the skills required to source a given commodity effectively.

References

Asanuma, B., 1989. Manufacturer-Supplier Relationships in Japan and the concept of Relation-Specific Skill. *Journal of the Japanese and International Economics*, 3(1), pp. 1-30.

Fine, C. and Whitney, D. E., 1996. Is the make-buy decision process a core competence? *Paper submitted to MIT IMVP Sponsors´ Meeting at Sao Paulo, Brazil*.

Please note that the included paper is the work-in-progress version presented at the EurOMA conference in 2013. Upon further analysis of the data from case Alpha, it was found that the two category setting denoted teams in this paper may, in fact, not be teams after all. Respondents showed no association with a team. Hence, in Paper 5 case Alpha is not presented as two teams.

Paper 3 – Lidegaard, N., Ellegaard, C. and Møller, M.M. (2015)

Sourcing teams and interdepartmental integration
Work-in-progress paper presented at the 31st Annual IMP Conference 2015, Kolding, Denmark

Keywords: Cross-functionality, sourcing teams, interdepartmental integration

This empirically based paper presents an exploratory case study concerning the implementation of internal integration mechanisms. A comparison is made between two different commodity categories within a company. One commodity is organized using a cross-functional team, while the other commodity does not utilize a team as an integration mechanism.

The comparison of the two settings revealed that besides of the team, then identical integration mechanisms (co-location and time allocated for supplier development) were implemented in both cases. Addressing the perceived performance of the two settings reveals that participants in both categories indicated similar integration levels. Further examination revealed that the similar integration levels did not indicate that implementing that a team does not contribute to the overall integration level. Rather, the notion of informal integration mechanisms was introduced. An informal integration mechanism is not promoted by management or the organizational structure; yet it contributes to the overall level of integration. The preliminary data analysis showed that an unofficial liaison person/integrator provided an explanation for the integration achieved in the category not utilizing a team.

Four propositions concerning the relations between formal and information integration mechanisms are formulated. These propositions concern the internal relationship between formal and informal integration mechanisms, respectively, as well as possible relations between the both types of integration mechanisms and the overall integration level. The propositions are subject for future research.

Paper 4 – Lidegaard, N. (2015)

The cohesiveness of sourcing teams
Work-in-progress paper presented at the 24th Annual IPSERA Conference, Amsterdam, The Netherlands

Sourcing teams are introduced as an approach to achieving the interdepartmental integration necessary for companies to address the complexity of strategic sourcing. Companies aim at facilitating teams capable of balancing the goals and tasks of the team with departmental expectations; however, the practical implementation is often unsuccessful leading to poor performance.

This conceptual paper introduces and operationalizes factors affecting sourcing team performance by combining two theoretical fields – social psychology and PSM. The operationalization of performance is concerned with perceived performance; hence, focus is on how team member experience the performance of a team. Originating in PSM literature, factors influencing sourcing team performance are categorized into three factors: top management support referring to the authority and empowerment given to the team. The second influencer is related to organizational structures, which related to the composition of the team. The third is related to team members and their level of training in e.g. teamwork.

The concept of cohesiveness is introduced as an explanatory factor. Special attention is applied to the components constituting cohesion. These are how attractive the team appears both to members and outsiders. The unity experienced by participants, and finally, the teamwork displayed in terms of working towards one goal and experiencing group morale.

Consequently, linkages between team cohesiveness and team performance are proposed. This results in the formulation of six propositions for further research.

Paper 5 – Lidegaard, N.; Ellegaard, C. and Møller, M.M. (2016)

Coping with differentiation in complex project manufacturing organizations: What managers do when formal integration is not working.
Submitted to: International Journal of Operations and Production Management

Keywords: Differentiation, integration, complex project, informal organisation, coping behaviour, case study.

In this empirically based paper, the challenge of getting managers from different functions to coordinate and integrate with one another is addressed. Arguing that beneath a macro layer of formal integration exist a micro organizational layer formed by informal behaviors, this paper represent an exploration of the behaviors identified in cases Alpha and Beta. The empirical setting is, thus, two successfully performing companies operating in a setting characterized by high differentiation and low integration.

Four overall types of behavior utilized by managers are identified. These are: accepting, collaborating, bypassing, and open conflicting. Furthermore, a number of different variations of these behaviors are identified. The first behavior is passive in nature, as respondents simply accept the decisions made in other functions. The remaining three (collaborating, bypassing and open conflicting) all rely on the respondents wishing to influence the decision-making process in other functions.

As a result management is proposed to separate formal structure (i.e. implementation of integration mechanisms such as co-location and cross-functional teams) from behaviors. The informal organizational layer is not easy to address and even more difficult to control; therefore a first step is to merely understand and acknowledge informal behaviors, and how they interlink with each other and the formal structures during the purchasing process.

In addition, future research includes further investigation into informal integration focusing on e.g. the different types of behavior as well as how formal and informal layers interlink.

CHAPTER 5. DISCUSSION

The purpose of this doctoral dissertation is to produce an academic output in the form of a contribution to further understanding of purchasing organization as well as the concept of integration and usage of cross-functional teams within a purchasing context. This chapter will outline how this doctoral thesis fulfills the purpose as well as outline the contributions of the conducted research.

This chapter is structured as followed; the overall scientific contribution of the dissertation is outlined through a separate assessment of each of the three RPs. For each of the RPs the contributions of the related papers are outlined before more general contributions are discussed. Also the chosen research design and its influence on the findings is briefly discussed.

5.1. RESEARCH PROBLEM 1

What are the characteristics of an effective or ineffective purchasing organization?

The thesis contributes to existing practices within PSM by illustrating how a contingency perspective can be used to understand the effectiveness (or lack hereof) of purchasing organizations. The choice of whether or not to implement a cross-functional sourcing team, or any other integration mechanism for that matter, depends on the context of the sourcing task. Paper 1 presents an overview of four externally related contingency factors inspired by organization theory. Thus, an effective purchasing organization is characterized by creating a fit between the sourcing process and the contingency factors.

The scope of the first RP is deliberately left quite broad, as the aim was to approach purchasing organization on more general terms. The literature study in Lidegaard, Boer, et al. (2015, also denoted Paper 1) revealed two prevailing solutions to organizing the purchasing task; one is related to the usage of cross-functional purchasing teams and the other focuses on whether to place the purchasing department in a centralized, hybrid, or decentralized position in the organizational structure. Cross-functional teams involve participants from multiple functions, and as outlined in Lidegaard (2015, also denoted Paper 4) implementation of such teams is not necessarily an easily achievable task. Elements such as managerial involvement and sourcing team composition need to be addressed in order to obtain a successful organizational structure; see further outline in Sections 2.1.3., 2.3.4 and

5.2. The effectiveness of implementing cross-functional sourcing teams, as the chosen approach to organizing purchasing, is dependent on characteristics such as uncertainty, variety, interdependence and complexity associated with the sourcing task and overall company structure. Thereby, the deductions presented in Paper 1 falls in line with research by Johnson & Leenders (2001), which found that changes in purchasing organizations were promoted by changes in characteristics of the overall company structure. Purchasing organization is, thus, dependent on the environment and context in which it operates.

Earlier research conclude that the use of the hybrid structure is on the rise (e.g. Glock & Hochrein 2011; Johnson et al. 2014). This observation could be interpreted as support for the contingency perspective adopted in Paper 1, as the hybrid structure allows for companies create a fit to the environment while balancing the benefits of both a central and decentralized structure. Hence, a hybrid practice can allow for a spectrum of different approaches to organizing strategic purchasing within the same company. However, implementing a complex hybrid structure can result in relatively high coordination costs (Rozemeijer 2000a); which may be one of the reasons why companies often choose to implement one purchasing structure throughout their entire organization rather than adapt the organization to the individual sourcing process. Category management is one example of a purchasing strategy which companies often struggle to introduce as a one-size-fits-all approach, because the individual commodity categories most likely won't have similar characteristics. Hence, where a cross-functional purchasing team is beneficial in one category, this is not necessarily the case for all the company's commodities. This viewpoint is supported by multiple authors (e.g. Rozemeijer & van Weele 2007; Murphy & Heberling 1996; Driedonks et al. 2010), who also found that implementing a uniform organization of purchasing tasks in the form of teams does not necessarily result in effective organizations. The doctoral thesis extents the notion that it cannot necessarily be assumed that teams will lead to an effective purchasing organization, if teams do not represent a suitable fit with contingency factors. A contribution of this doctoral research is, thus, the notion that when discussing purchasing organization a fit between the task at hand and the environmental factors must be considered. Applying a contingency perspective is not an unfamiliar approach in PSM research. Multiple authors (e.g. Johnson & Leenders 2001; Laios & Moschuris 2001; Rozemeijer 2000a) have adopted the notion that contingency factors must be accounted for when designing an appropriate organizational structure. Yet, it appears that the conclusion can bear to be repeated, as the field of PSM continuously appears to neglect to reflect upon the situational setting and context dependent factors when addressing purchasing organization. The characteristics of an, respectively, effective and ineffective purchasing organization is, thus, dependent on how well it fits the situational circumstances. Future steps should focus on which contingency factors could be relevant to include in a purchasing setting. Examples of four characteristics (borrowed from organization theory) related to purchasing processes and two

organizational characteristics are combined to form a typology. Thereby, the conceptual thoughts presented in Lidegaard, Boer, et al. (2015) follows notions similar to Glock & Hochrein (2011), who also operate with contingency factors related to the purchasing situation (similar to the process) and organization. In addition hereto, they also include contextual factors related to the external environment and the product (Glock & Hochrein 2011). In general, the concept of fit is seldom addressed in PSM literature, regardless of this being fit to environmental context (addressed in this this doctoral research) or internal strategy (as presented by e.g. Chandler Jr. 1962). Hence, a contribution to the PSM field is the concept of fit and re-introducing it when addressing purchasing organization.

Although, this doctoral thesis contributes to PSM literature by proposing that the optimal organizational structure is situation dependent; then not despite of – but in continuation hereof – it is argued that proposing managerial implications and general design rules still have merit. Generic managerial design rules represent guidelines increasing the possibility for effective purchasing organization. As such, this doctoral research, therefore, does not discard the search for universal design solutions, as long as they are of such nature that they can accommodate the different settings that a single company's different purchasing tasks represents.

5.2. RESEARCH PROBLEM 2

How do various characteristics of cross-functional purchasing teams contribute to team performance?

Extending on the contribution of RP1, the empirical study presented in Paper 2 contributes by establishing that contextual, contingency factors are not exclusively external to the sourcing process. Paper 2 suggests that the knowledge needed to purchase a given commodity is a contingency factor influencing whether or not a team performs effectively. Searching for explanations within other research fields concerning teams or groups, the conceptual discussion in Paper 4 adopts the concept of cohesion from social psychology to describe cross-functional purchasing teams. Utilizing cohesion to understand internal characteristics of cross-functional sourcing teams and how it affects team performance is, thus, a contribution of this doctoral research. Therefore, the research contributes to the PSM field by suggesting a research agenda for future research into the cohesion of cross-functional sourcing teams.

Extending on the application of a contingency perspective in purchasing organization, the two categories examined in Møller et al. (2013) are organized in similar ways, but are perceived to be performing, respectively, poorly and

successfully. Thereby, the findings of Møller et al. (2013) lends support to the notion of fit, as the different nature of the categories entail that the chosen organizational structure fits one category better than the other. Based on previous research (e.g. Ellram & Pearson 1993; Trent & Monczka 1998), it was expected that the introduction of a team structure would promote well-performing purchasing organizations. However, as is the case in Møller et al. (2013, also denoted Paper 2) the teams emanate from and is promoted by the purchasing department. In Møller et al. (2013) the remaining functions appear less invested in the teams, indifferent or even unaware of their participation in the so-called sourcing teams. Even though managers utilize the team label; the question is if the presented situation even warrant to be denoted cross-functional purchasing teams. This is not an uncommon question related to these purchasing teams; as mentioned above, it is supported by previous studies confirming that the implementation of teams are often unsuccessful. Yet teams continues to be a preferred approach when organizing purchasing (Lidegaard, Boer, et al. 2015).

Lidegaard (2015, also referred to as Paper 4) represents a contribution to the PSM field by introducing cohesion from social psychology to a PSM context by arguing that cross-functional purchasing teams are essentially task-oriented work groups. Cohesion is evaluated as suitable in a cross-functional purchasing team context; as such team constitutes a workgroup with a common goal. This is in line with observations made by Englyst et al. (2008), who argue that team members must be motivated to perform as a team, and Driedonks et al. (2010) listing employee involvement as an important predictor of sourcing team success, respectively. Cross-functional purchasing teams have a boundary spanning function, as they have the purpose of improving the integration and coordination between functions. Research within PSM has already yielded several factors affecting sourcing team performance; these are grouped into three overall factors: managerial support, organizational structure and factors related to team members. Each of the three overall themes can be related to a construct within cohesion. Cohesion is operationalized using the constructs attractiveness, unity and teamwork. Three propositions are formulated linking each of these constructs, respectively, to findings from PSM research regarding successful sourcing team implementation. Thereby, the research presented in this thesis contributes to the field through its conceptual discussion of cohesion as an alternative approach to understanding the success of cross-functional purchasing team implementation – and subsequently the teams' performance. Although the propositions need to be subjected to empirical testing, they propose an approach to thinking about teams not only as a structural element. This conceptually founded future research agenda is, thus, a contribution to PSM research.

Introducing cohesion into PSM research entails presenting the argument that the internal coordination and integration mechanisms within the team is important to address when evaluating the relative success of such cross-functional sourcing

team. A team is not only a structural element in organization, but should also be viewed as relations between the participating individuals. This conclusion interlinks with the findings of Lidegaard, Ellegaard, et al. (2015, paper 3) and Lidegaard et al. (2016, paper 5) proposing that integration cannot only solely be addressed as structures and procedures, but can addressed from an informal and/or quality perspective as well. Elaborating on this view, the notion of team performance should be addressed. Lidegaard (2015) operates with perceived performance, where respondents were asked to evaluate how they experienced the performance. The goal was, thus, not to measure performance on a scale, but to understand *how* performance was understood and felt by the involved parties. This approach to evaluating performance qualitatively is suitable for the research as hand, as it allows for relations to be examined (e.g. what may promote or hinder good performance) rather than conclude a measure indicating the level of performance. The thesis initiates the discussion on how to evaluate performance of purchasing organization, in particular cross-functional purchasing teams, through the perceptions of the participating managers and employees. Such approach would need further refinement in the future, and further discussions on the implications of evaluating performance qualitative are needed.

5.3. RESEARCH PROBLEM 3

*How do different formal and informal integration
mechanisms affect overall integration between
purchasing and other purchasing relevant functions?*

The empirical study presented in Paper 3 revealed the co-existence of formally and informally implemented integration mechanisms. An agenda for further research into the relationship between the formal and informal integrations mechanisms is formulated on the basis of the empirical findings, and it represents a contribution of this thesis. Extending on these findings, Paper 5 contributes by providing a detailed account of the behaviors used to create informal integration in two cases of low formal integration and high differentiation. Thereby, this thesis contributes to the PSM literature by showing that the quality of implementation (looking at both formal and informal aspects) should be considered when evaluating the overall level of integration.

Lidegaard, Ellegaard, et al. (2015, also referred to as Paper 3) and Lidegaard et al. (2016, Paper 5) are both empirically based papers addressing integration. Lidegaard, Ellegaard, et al. (2015) focus on the quality of implemented integration mechanisms as well as introduce the notion of informal integration, while Lidegaard et al. (2016) reflects further upon the concepts of formal and informal

integration. Lidegaard, Ellegaard, et al. (2015) compares different purchasing settings within case Beta. Two categories are in focus; where one is run by a cross-functional team and the other is managed by individuals from the different departments. Yet, similar levels of integration are detected. This is in contrast to most PSM literature, as there is an inherent assumption that applying integration mechanisms increases the overall level of integration. Thereby the research lends support to the notion of e.g. Turkulainen & Ketokivi (2012) who also criticizes other studies on integration to assume that all implementations of a given integrative mechanism is equally likely to achieve the suggested performance benefits. Based on the underlying notion that it is necessary to evaluate the quality and depth with which in integration mechanism is implemented, Lidegaard, Ellegaard, et al. (2015) present four propositions related to the relationship between informal and formal integration mechanisms. These propositions are subject for further research in future work. They represent a broader approach to integration within PSM literature, as it challenges the perception that e.g. implementing a team structure necessarily increases the overall level of integration. This contribution is extended by the findings in Lidegaard et al. (2016), which also suggest that it is not enough to conclude which structures are implemented when evaluating integration. Applying a quality perspective fit well with the research problem addressing *how* different integration mechanisms influence the overall level of integration. High quality in the implementation is argued to be present when integration mechanisms are reported to be deployed and working as intended. On the other hand, poor quality in this respect entails employees reporting little integration despite the efforts made by management. The notion of quality is not new in regards to integration, as Lawrence and Lorsch (1986) include the concept in their definition of integration. However, in a PSM perspective the quality of implementation of a given integration mechanism is not addressed. As mentioned above, it is often an inherent assumption that implementing an integration mechanism will result in integration. Hence, this doctoral thesis contributes the ongoing discussion of achieving integration within purchasing by illuminating the difference in terms of high or poor quality implementation of an integration mechanism. The notion of quality of integration should be subject to further investigations in future work. The purpose of such research would be to further the understanding of how the degree of quality can be determined. For this purpose, data from case study Delta has been collected.

The doctoral thesis contributes to PSM literature by empirically verifying that there is a need to separate formal and informal aspects (in essence, structure and behavior) when addressing integration. Implementing e.g. a team structure does not necessarily ensure that employees actually act and react in an integrated manner. Hence, integration is not just formal, structural integration. Integration contains a different layer relating to the informal actions taken by employees. Sometimes these informal aspects are behaviors or it can be a personal decision to act as a liaison role within official, formal authorization. Lidegaard et al. (2016, also denoted Paper

5) identify four types of micro behaviors that stand-in instead of formal integration mechanisms to facilitate information exchange and decision-making in highly differentiated settings. Both Lidegaard, Ellegaard, et al. (2015) and Lidegaard et al. (2016) indicate that the informal layer of integration is driven, largely, by individuals' motivations, agendas, and incentives. Some critical employees chose to accept the state of affairs, while others bypassed established procedures and generated alternative organizational solutions. Informal integration mechanisms, thus, interweave with the formal layer thereby facilitating (successful) integration. Future research is necessary to elaborate empirically on the promoters of informal integration as well as more thorough relations between formal and informal integration e.g. through empirical verification of the propositions presented in Lidegaard, Ellegaard, et al. (2015). However, still, it is an important contribution of this thesis to stress the need for acknowledging that integration extends beyond organizational structures. The empirical data indicates that in some instances informal integration can constitute a replacement of formal integration. Thereby, informal integration is not "just" an extra layer or add-on to formal integration; rather it is an equal set of integration mechanisms requiring further elaboration. The findings of an informal integration layer capable of substituting official integration mechanisms must not be interpreted as managers not needing to organize purchasing integration. Informal integration mechanisms are believed to emerge as employees take action often beyond the official scope of formal integration mechanisms. However, this does not entail that managers can rely on informal internal integration will emerge if formal integration is lacking. Instead managers need to include the informal aspect when analyzing and evaluating the level of integration within their organization.

Finally, as seen above in the examination of RP1, Lidegaard, Boer, et al. (2015) build on the two theoretical fields of contingency theory and organization theory in the analysis of the identified literature on purchasing organization. The concept of cohesion from social psychology is also introduced into a purchasing setting in this doctoral thesis. Drawing upon different theoretical fields is not an unknown in PSM literature, e.g. integration (e.g. Förstl et al. 2013; Horn et al. 2014) and creativity (e.g. Kiratli, Rozemeijer, Ruyter & Jong 2015). Based on the theoretical foundation presented in this thesis, a brief note must be made regarding *how* the PSM literature draws upon concepts from other theoretical fields, as the conversion can sometimes appear imperfect. To an extent it appears that constructs are redefined in a purchasing setting without paying respect to the original theoretical setting. Take for instance, the concept of integration. It is often applied in a purchasing context; however, little or no attention is paid to *differentiation*. In the original work of Lawrence and Lorsch (e.g. 1967 and 1986) these two constructs should not be separated, as low differentiation has little demand for integration; while highly differentiated settings should be matched with high integration. High integration is, thus, not necessarily desirable. It may even be argued that the concept of integration is removed from its original theoretical correlation and re-invented in PSM as

independent of differentiation. As a result PSM literature often presents integration as a goal to be achieved; a mature state to be desired for. By recognizing the achievement of integration as a goal in itself, the PSM literature discards the notion of fit that originally underpinned the concept of integration. A well-intended invitation to remember the contexts from which theoretical concepts are borrowed is, thus, extended to researchers within PSM.

5.4. RESEARCH DESIGN

The purpose of this section is to briefly comment upon and evaluate the chosen methodology. As outlined in Chapter 3 case studies were conducted, as they form an appropriate choice for addressing the presented research problems.

The purpose of this research has been to explore how strategic purchasing should be organized – especially with focus on formal and informal integration mechanisms. Applying open-ended, semi-structured interviews as the main method for data collection allowed for respondents to answer in their own narrative. In hindsight, it is remarkable how honest, open and willing to share that all respondents were. This candidness is definitely an important factor to be regarded as the success of the research design is evaluated. Had respondents, instead, been guarded and unwilling participants the findings could have been less solid; however, this is a potential pitfall for all research methods involving respondents.

The analytic phase proved difficult as the researchers (PhD student and supervisors) needed to beware of the multiple languages and personal interpretations held by respondents. This emphasized the need for a joint coding and avoiding bias by ensuring that one researcher's interpretation of quotes did not stand unchallenged by a fellow researcher. This represented a clear learning curve, as the PhD student as interviewer also evolved into the role, and ensured that respondents elaborated their answers enough to allow for comparisons to be drawn between interviews.

A final note should be made in regards to the evolution of the findings in Paper 2. As mentioned above in Chapter 4, the interpretation of quality of the implementation of teams in Alpha has challenged in Paper 5. In this instance, it is important to recognize that initial analysis can be challenged at a later stage. Paper 2 is still included in this doctoral thesis, as it represents the first work of the PhD student as well as includes important observations on fit between organizational setting and context.

CHAPTER 6. CONCLUSIONS

This doctoral thesis concerns organization of strategic purchasing. In particular, the objective of this research has been to enrich the current knowledgebase within PSM research by exploring the concept of purchasing organization with a focus on cross-functional teams and integration. More specifically, attention has been paid to how the cross-functional purchasing teams can be utilized effectively as well as the notions of formal and informal integration mechanisms. The following three general research problems have been pursued:

- What are the characteristics of an effective or ineffective purchasing organization?
- How do various characteristics of cross-functional purchasing teams contribute to team performance?
- How do different formal and informal integration mechanisms affect overall integration between purchasing and other purchasing relevant functions?

These research problems were addressed throughout the thesis as well as illuminated through the research questions examined in the five included research papers. Two of the included papers are conceptual, while the remaining three papers are empirically founded in two of the three conducted case studies. Findings from the third case will be included in future research. The three cases are all project-based, multi-national companies delivering large industrial installations. A total of 47 semi-structured interviews with respondents from multiple departments within the three companies constituted the empirical basis of the thesis.

Focus in purchasing and supply management (PSM) literature has generally been devoted to purchasing organization in terms of team utilization and discussions on centralized versus decentralized organizational structures. This thesis expands on this view by stipulating that cross-functional purchasing team usage is just one of many possible integration mechanisms. By drawing upon organization theory, integration is addressed as an appropriate response to differentiation. The theoretical chapter in the thesis presents a review of the theoretical foundation applied in the five included papers. In addition to purchasing theory and organization theory, the included theoretical background include contingency theory addressing how an effective purchasing organization must be designed to fit both internal and external contingency factors. Furthermore, the concept of cohesion is adopted from social psychology in an effort to understand the internal dynamics of a cross-functional purchasing team, and how this may influence team performance.

The included papers each contributes with individual aspects related to the research problems addressed in this thesis. Based on a literature review on purchasing organization, paper 1 applies a contingency perspective and presents four externally related contingency factors to be accounted for when designing a purchasing organization. Paper 2 is empirically based and suggests that also internal contingency factors should be accounted for when determining the best suitable purchasing organization. Paper 3 is also empirically based, and it introduces the discussion of formal and informal integration mechanisms. A research agenda in the form of propositions concerning the relationship between, respectively, internal and external integration mechanisms as well as overall integration level are proposed. The conceptual discussion in paper 4 concerns the use of cross-functional teams in purchasing organization. The discussion indicates that the concept of cohesion from social psychology is useful to apply within PSM research. Propositions regarding cohesion and team performance are formulated. Paper 5 presents an empirical account of formal and informal integration. More specifically, the behaviors adopted by the respondents as a response to high differentiation and low overall, formal integration is mapped. Based on the findings presented in the five research papers; the overall contributions of the thesis are summarized to:

- The utilization of contingency perspective when designing effective purchasing organizations. These contingency factors may be external as well as internal to the sourcing task. Characteristics of an effective purchasing organization are, thus, dependent on the nature of the task and the surrounding setting.
- The concept of cohesion provides insights into how internal elements of a cross-functional purchasing team can be addressed, when evaluating the performance of a team. Essentially, it is argued that a cohesive team constitutes a higher quality of integration than a non-cohesive team. A future research agenda on how cohesion can be used to describe characteristics of cross-functional purchasing teams and team performance is subject for further research.
- The co-existence of formal and informal integration mechanisms. A research agenda into the relationship between the formal and informal integration mechanisms is formulated on the basis of the empirical findings. It is argued that not only formal integration mechanisms should be included when assessing the level of integration as informal mechanisms also influence the overall level of integration.
- By identifying the behaviors of employees operating within high differentiation and low integration, this thesis contributes to the PSM literature by outlining that different behavior may, respectively, foster or hinder integration.

6.1. PRACTICAL AND MANAGERIAL IMPLICATIONS

The nature of this research has evolved into quite conceptual discussion on how to adopt pre-existing concepts from other theoretical fields into a strategic purchasing context. Yet, there are still a few practical implications that managers and CPOs can build upon in their daily work.

- Managers should apply a contingency-based perspective when organizing the individual purchasing categories. Hence, as outlined above, it is not a given that the organization appropriate in one purchasing process or commodity category is suitable to be replicated into other contexts successfully. Attentions should be paid to identifying the specific contingency factors differentiating sourcing tasks within a given company. Such practice could guide managers to understand which organizational design parameters they need to attend to in their purchasing organization.
- Teams are (just) one of many applicable integration mechanisms; hence, there is a need to confront the one size fits all approach, as teams are often presented as a universal solution in PSM literature. Managers therefore need to evaluate if, in fact, teams foster integration in the context at hand, and furthermore, possibly differentiate as a team may be suitable for some commodity categories and not others.
- Also managers need to include the notion of informal integration when evaluating their organizations. Hence, managers need to access and evaluate how the behavior of employees influences the level of integration. It is not unlikely that employees execute procedures not officially sanctioned etc. to increase the integration. Hence, such behavior can potentially be formalized to increase official, managerial control of the integration at hand. However, it is uncertain if it is necessarily beneficial to convert all integration mechanism to a formal state; hence, it is subject for further research as well.
- Further managerial implications are related to whether the applied formal integration mechanisms indeed promote overall integration. Hence, managers should not presume that implementing a given integration mechanism necessarily adds to the overall integration level if the quality of the implementation is lacking. Hence, managers need to ask the members of the organization how they perceive the implementation of the applied integration mechanisms.

6.2. FUTURE RESEARCH

This doctoral thesis propose an agenda for further research into specifically how other theoretical fields, specifically those of integration and team cohesion, can be incorporated into PSM literature. Future research includes empirical testing of the two sets of propositions from papers 3 and 4. The propositions may be tested

through survey and statistical analysis or qualitative studies as each method represents equally valid approaches. Future research should aim at increasing the understanding of group processes in a purchasing context. Further qualitative investigations into cohesion could elaborate on how the different elements of cohesion contribute to the integration level within the team as well as the overall team performance. Furthermore, the thesis initiates the discussion on how to evaluate performance of purchasing organization, in particular cross-functional purchasing teams, through the perceptions of the participating managers and employees. Such approach would need further refinement in the future, and further discussions on how to evaluate team performance qualitative and the implications hereof, should be subject for future research.

The notion of formal and informal integration within purchasing should be subjected to further research. It would be useful to expand on how different combinations of formal and informal integration mechanisms influence the overall integration levels as well as performance related to a purchasing task. Also, it would be interesting to further elaborate on implications related to potentially transforming an informal behavior into a formal integration mechanism. Is this necessarily a desirable transformation? Or might it be preferable to keep some of behaviors and integration mechanisms informal? Future research into the topic should disclose additional insights into the nature of the relationship between formal and informal integration mechanisms. Also, studies focusing on different integration mechanisms than the team can expand on the relationship between formal and informal integration as well as which contingency factors that are particular relevant in a purchasing setting.

Another aim of future work would be to elaborate on how to assess the quality of implementation related to integration as well as explore the linkages between informal and formal integration mechanisms. A first step to future research has already been made, as data collection has commenced at case Delta. Future analysis of this data-set is believed to shed further light on the quality perspective, as data from the third case study concerns e.g. how integration is achieved in a global category setting.

The project-based context in which the companies examined in the case studies operate in only increases the experience complexity. The organization of purchasing, here, needs to be capable of encompassing the multiple different forms that a project can undertake, as some projects may require little purchasing involvement while others are dependent on purchasing in their execution. The conclusions of this thesis should, therefore, be tested in a comparative study including project-based companies and more traditional (mass-)producing companies. Such research could clarify the impact that the project-based nature of the three case companies had on the findings in this thesis.

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