Master thesis report

Sourcing in 2020: a benchmark of manufacturing companies' source-to-contract and electronic reverse auction practices

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Abstract

Digital sourcing platforms were invented in the last decade of the 20th century and brought tools such as electronic reverse auctions (eRA) into the hands of purchasing professionals. The Trelleborg Group initiated a project to implement such a digital sourcing platform last year but the research in the field is outdated. Focus was directed to the choice of sourcing approach, i.e. either using digital sourcing processes or traditional sourcing processes, and the configuration of successful eRAs.

A cross-case study was performed with five global manufacturing companies and one large construction company to update the theory. It was important that the study included manufacturing companies to increase the level of transferability between the cross-case and the Trelleborg Group. Because in parallel to the cross-case study an internal case study was performed at Trelleborg Group in the business unit Engineered Coated Fabrics. The findings in the cross-case study were contextualised and applied to the Trelleborg Group.

Purpose

The purpose of this research project is to develop an up-to-date framework for Trelleborg Group in regards to how they should choose among their available sourcing approaches as well as how to successfully configure their electronic reverse auctions.

Conclusion

The generalised findings for the study are divided into two separate parts. In the first part a decision model for choosing among available sourcing approaches is presented. It highlights the barriers preventing a purchaser from conducting competitive supply market exercises and if no barriers exist it states that digital sourcing process will always be preferred over traditional sourcing events. An eRA should always be preceded by an electronic RFQ (eRFQ) and fulfill three criterias: minimum of three suppliers, supplier bids must be comparable and not inviting or hurting strategic partnerships.

The second part entails the configuration elements that affect the success of an eRA. These are classified into three tiers, with different underlying goals to each tier. The first tier is the governance structure and the underlying goal is to ensure eRA recurrence and healthy supplier relationships. The second tier is the optimisation of the competitive environment with the goal to leverage the competitive environment and enable sustained price reductions. The third tier is the strategic alignment of the eRA program with the goal to integrate the eRA process with the overall sourcing process.

Contribution

This thesis has been a complete elaboration between the two authors. Each author has been involved in every part of the process and contributed equally.

Keywords:

Sourcing, digital sourcing, eSourcing, source-to-contract (S2C), electronic reverse auction (eRA), eAuction

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Fabian Markhed Maxe and Eric Mace

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Table of abbreviations

ASP	-	Application Service Provider
eRA	-	Electronic Reverse Auction
RFI	-	Request For Information
RFP	-	Request For Proposal
RFQ	-	Request For Quotations
RFx	-	Request For Information/Proposal/Quotation
eRFx	-	Electronic Request For Information/Proposal/Quotation
TIS	-	Trelleborg Industrial Solutions
TWS	-	Trelleborg Wheel Systems
TSS	-	Trelleborg Sealing Solutions
B2B	-	Business-To-Business
PE	-	Purchasing Excellence
F2F	-	Face-To-Face
BA	-	Business Area
BU	-	Business Unit
ECF	-	Engineered Coated Fabrics (Trelleborg Group business unit)
R&D	-	Research and Development
CSR	-	Corporate Social Responsibility
RPA	-	Robotic Process Automation
IT	-	Information Technologies
SRM	-	Supplier Relationship Management

1 Introduction

This chapter will shortly cover the background of the thesis project as well problem description. Purpose, research questions as well as the focus and delimitations of the study will be elaborated. Concludingly the content and structure of the thesis will be explained.

1.1 Background

This research stems from a recent initiative by Trelleborg Group to assess the viability of implementing an electronic sourcing (eSourcing) platform and how well a system could facilitate their sourcing processes. The eSourcing initiative was initiated by Trelleborg Group's Purchasing Excellence board which consists of the VP Group Purchasing along with selected regional purchasing managers for direct and indirect categories. At the time of this research project the Purchasing Excellence board had just completed a minor eSourcing pilot project in conjunction with a chosen application service provider (ASP). Although conducted in a very small scale, the pilot project was completed with very satisfactory results for both electronic request for quotations (eRFQs) and electronic reverse auctions (eRAs), as compared to their traditional sourcing processes of email based RFQs.

The subsequent desire by Trelleborg Group's Purchasing Excellence board to further analyse the viability and organisational fit of rolling out the eSourcing platform in their decentralised purchasing organisation serves as the context for this research project. When introducing an eSourcing platform, Trelleborg Group found themselves in a situation where new and unfamiliar sourcing approaches were available as well as even more complex combinations among such approaches, as illustrated in Figure 1.1. Their situation raised the question as to how they were to choose between such approaches and how to communicate its use within their vast organisation. Thus uncertainties regarding how to adequately operate an eSourcing platform on a large scale stood in the way of rolling out the project in a wider setting. The mentioned uncertainties were especially related to which aspects influence the choice between eSourcing and traditional sourcing approaches when a set of goods or services are to be sourced, and how and where an eSourcing platform would fit into Trelleborg Group's established purchasing portfolio categories. Lastly, Trelleborg Group aspired to learn successful configuration of eRA sourcing events and which the configuration elements are that drive such success.

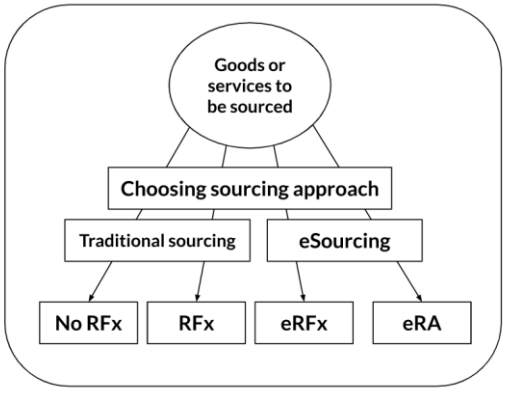

Figure 1.1. Trelleborg Group's newly available sourcing approaches.

The relevance of this research project is further solidified by the fact that eSourcing had its trend peak just under 20 years ago and was thus conducted as traditional sourcing processes were often offline and based on inefficient company-to-company one-way negotiation techniques. As a result, available eSourcing research is becoming outdated and has to some extent lost its applicability in existing business contexts. Neef (2001) early presented attractive process synergies from adopting eSourcing and eProcurement tools. Such purchasing tools at

the time showed up to ten times more productive overall purchasing processes along with substantial potential to reduce purchasing spend, as compared to “the current labour-intensive phone- and fax-based purchasing processes” of that time. All in all a good baseline was set to transition towards digital purchasing processes (Neef, 2001, p. 8). Without doubt, eSourcing and eProcurement early showed potential that have since made both concepts very widely adopted and competitive compared to its traditional purchasing approach alternatives, as seen in Figure 1.2.

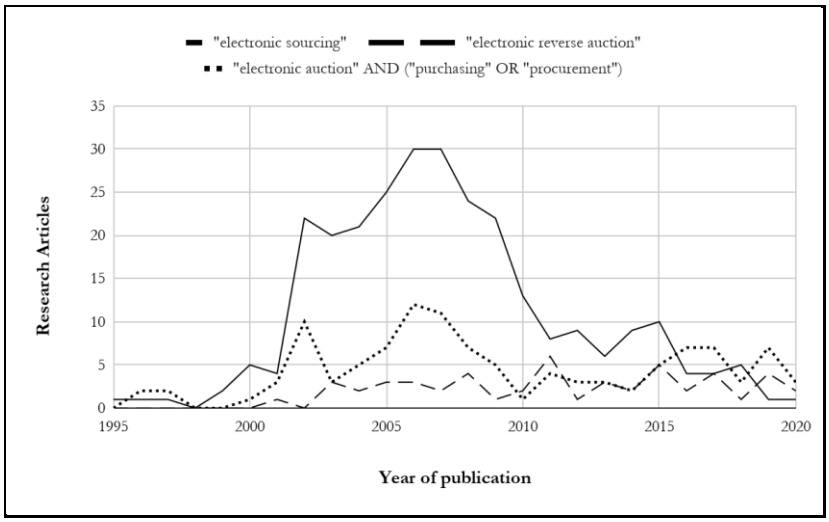

Figure 1.2. Research history of eSourcing and eRA.

However, 20 years later “traditional sourcing” no longer means RFx processes per fax machine or telephone and the alternatives to implementing third-party eSourcing platforms are arguably also more sophisticated and competitive today. Email, instant messaging over the internet, EDI integration and the ease of supplier contact information access have made the administrative tasks of supplier relationship management (SRM) much more efficient (van Donk et al., 2008). Also the eSourcing software industry has parallelly been improved and consolidated and is today often provided by ASPs which can offer organisational training and other consultancy services parallel to the software solution itself. Hence, potential barriers and benefits of using eSourcing platforms might differ today from how they were initially described. A new upswing in eSourcing and eRA related research has further been seen between 2010-2015 due to increased use in public procurement, due to its competitive and transparent characteristics.

The application of eRAs was researched parallelly to eSourcing and since both of their trend peaks in the beginning of the 21st century, eRAs are now described as an adequate tool for industrial buyers to efficiently apply additional purchasing leverage in competitive market situations. However, despite the fact that several benefits of conducting eRAs as a possible tool in a larger eSourcing setting have time after time been pinpointed in research (Elmaghraby, 2007; Carter et al., 2004; Beall et al., 2003), the adoption of eRAs seem to be lagging compared to other functionalities and tools encompassed by eSourcing platforms. As an example Teo et al. (2009) concluded from a comprehensive cross-industry case study that even among a sample of companies which were already several years on average into their eProcurement maturation process, only 27% were hosting eRA events whereas about 70% did maintain eRFx processes. Meanwhile it should be noted that eRA supported sourcing processes have recently gotten significant traction in public procurement due to new legislation practices that demand eRA because of the process transparency and market competitiveness characteristics which it entails. For instance the US General Services Administration, responsible for public procurement for US federal agencies, increased its use of eRAs by 1000 percent between 2014 to 2015 due to such public procurement legislations (Schoenherr, 2019, p. 90). When comparing eRA to more traditional sourcing approaches such as conducting email-based RFx processes or direct negotiations, eRAs are often described in a less straightforward manner. eRAs are often subject to bigger emphasis on the need for well-

defined specifications and thought-through design throughout the sourcing process (Arnold et al., 2005). Other digital sourcing approaches such as RFx processes through ASP eSourcing software and its increased efficiency (often called eRFx) are instead compared with traditional email-based RFx processes. Hence, ambiguity in the form of various complex configuration elements in regards to when and how eRAs are adequately applied is what could potentially make industrial buyers reluctant to adopt its use as a way of diversifying their sourcing toolbox.

There is a lack of relevance regarding current best-practices and the benefits of using eSourcing platforms provided by ASPs. The aim of this project is thus to extend literature with an up-to-date eSourcing framework based on relevant benchmarking in the form of multiple-case research, in regards to when and how different eSourcing tools should be applied and the logic which governs the choice between each tool. Furthermore, it is deemed important for this research to refine the theoretical knowledge and improve the categorisation of the configuration elements which are argued in literature to have effect on the outcome of eRA events.

1.2 Purpose

The purpose of this research project is to develop an up-to-date framework for Trelleborg Group in regards to how they should choose among their available sourcing approaches as well as how to successfully configure their electronic reverse auctions.

1.3 Research questions

The research will answer the two research questions posed:

First Research Question (RQ1): Which are the aspects and situational factors that influence the choice among available sourcing approaches within and outside an eSourcing platform?

Second Research Question (RQ2): What are the configuration elements which affect the success of utilising electronic reverse auctions?

The research questions and their context are visualised in Figure 1.3 below. The first research question will investigate how different aspects around the sourced goods or services will influence the applicability of different sourcing approaches. The second research question will deepdive on the dynamics of using eRAs in a sourcing process, by identifying what elements are important to configure to achieve success in the eRA.

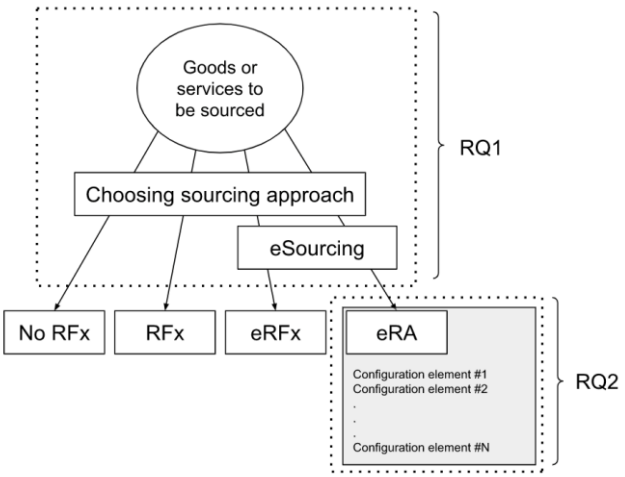

Figure 1.3. Visualisation of the research questions in their context.

1.4 Focus and delimitations

The focus of this research project was to analyse the concept of using eSourcing platforms, but in a rejuvenated context. The aim was to make transferable insights as to how industrial manufacturing companies have adopted the eSourcing concept in 2020, by creating an up-to-date industry benchmark based on insights from a multiple-case study. The chosen multiple-case design is embedded, meaning the research maintains multiple units of analysis (Yin, 2009, p. 54-55). The units of analysis are:

1. The choice of sourcing approach, and how aspects and situational factors influence the use of either direct negotiations, RFx, eRFx or eRA;
2. The electronic reverse auction, and how it is configured.

The main research focus was to analyse which factors need to be assessed when making the choice between different sourcing approaches with or without an eSourcing platform (specifically RFx, eRFx, eRA and/or single-supplier company-to-company negotiation), as well as which elements are critical to achieving success in eRA events. It should be noted that there are other ways to conduct a sourcing process prior to contracting a potential supplier. However the tools mentioned above were the ones deemed relevant to this type of sourcing context when initially delimiting the scope in conjunction with the internal project stakeholders at Trelleborg Group.

The research did not have an IT architecture focus and neither did it aim to give insights as to how eSourcing platforms are best implemented in an integrated IT structure. But rather it focused on how industrial manufacturing companies can apply eSourcing in a non-integrated way to solely support the sourcing processes and improve purchasing efficiency in a potentially decentralised organisation, while still creating sourcing transparency and visibility. This delimitation was in place to ensure that the insights were addressable and relevant to Trelleborg Group and their current eSourcing initiative. However, insights regarding what governs the choice among available eSourcing tools and which configuration elements are critical to eRA event success in a non-integrated IT structure can still be considered transferable (but arguably sub-optimal) to an integrated IT structure. Whereas the reverse situation would be harder to argue for, as application frameworks for an eSourcing platform which is integrated into a larger IT structure might have structural prerequisites which contextually disqualifies the logic of that implementation framework in regards to a non-integrated use of eSourcing platforms.

1.5 Research report structure

The report consists of ten different chapters. To initiate the reader, a wide but shallow introduction is presented to build interest in the subject and present the purpose of the research. Then follows an organisational and structural description of the Trelleborg Group to present the company where the project was initiated. A thorough theoretical walkthrough is presented in chapter three where the reader is introduced to the theoretical concepts and models that creates the base for this thesis. The reader is then presented to the methodology explaining the scientific approach and research method chosen in chapter four. In the fifth chapter three of the single case reports are presented (with the remaining three case reports found in Appendix C). These reports first include the empirics of the cases, all of which then end with an individual within-case analysis. In chapter six a cross-case analysis is presented using the empirics and analysis from all of the six cases. The internal case is presented in chapter seven. With the internal case context and the generalised insights gathered from the external cross-case analysis, chapter eight is written with implications and recommendations for Trelleborg Group in regards to their eSourcing initiative. Chapter nine ties the report together by presenting the conclusions as a summary of the key findings and some suggested further research. Finally references and appendices are presented.

2 Presentation of Trelleborg Group

This chapter provides a short introduction to the Trelleborg Group and its purchasing organisation. A more detailed overview of the company will be presented in the internal case in chapter 8.

Trelleborg Group is a business-to-business (B2B) manufacturing company that specialises in engineered polymer solutions that seal, damp and protect. Trelleborg Group's strategy is market leadership within niche polymer-based manufacturing. Through consistent manufacturing focus, the company has since it was founded in 1905 become a world leader of polymer solutions (Trelleborg AB, 2019a, p.1).

2.1 Corporate structure

The Trelleborg Group is organised into three business areas plus an area for businesses under development (Trelleborg AB, 2019b), depicted in Figure 2.1. Group Purchasing is a part of the Group Functions and has a team consisting of five members, out of which four are located in the Swedish headquarters and one in the U.S.

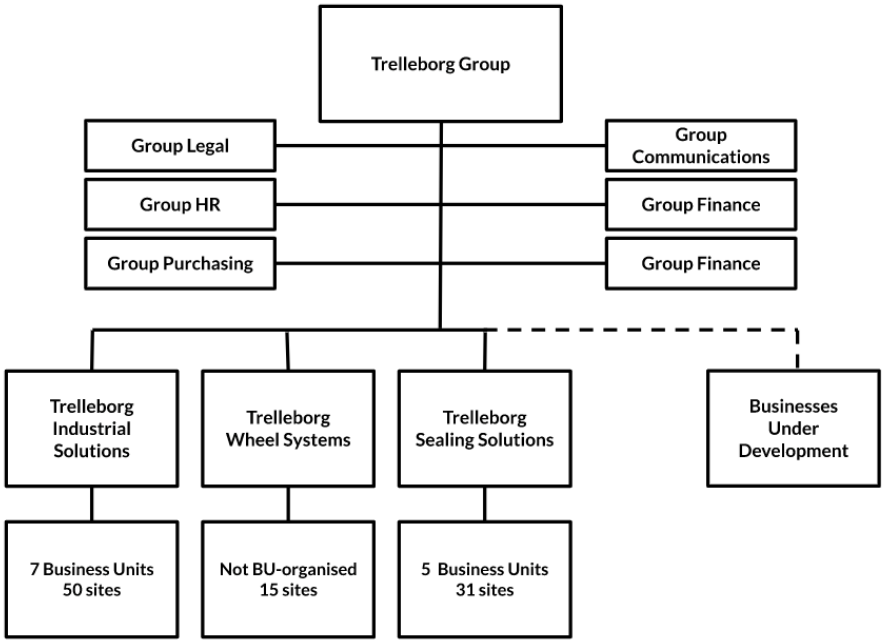

Figure 2.1. Trelleborg Group's corporate structure and Group Purchasing.

Trelleborg Group's three business areas (BA) consist of a combined 19 business units (BU). A few BUs are located at multiple sites and together all 19 BUs manufacture products in 40 different product areas. The main raw materials in all BUs are synthetic and/or natural rubber, but the products are diverse and often niched into specialised categories with different demands of quality. The company expansion has mainly been through acquisitions and the Group Management leads with a principle of decentralised authority and responsibility at the respective BU. The BUs are run independent and are locally responsible for keeping profit, balance sheet and cash flows by letting the coworkers make their own commercial decisions (Trelleborg AB, 2019a, p. 80). The four following business areas are defined in Trelleborg organisational structure:

- *Trelleborg Industrial Solutions (TIS):* TIS is the merger from 2019 between the previous three BAs: Trelleborg Industrial Solutions, Trelleborg Offshore & Construction and Trelleborg Coated Systems. TIS specialises in niche applications and infrastructure projects. The annual sales are approximately 11B SEK (Trelleborg AB, 2019a, p. 89).

- *Trelleborg Wheel Systems (TWS):* TWS became a large BA after the acquisition of Czech company CGS Holding in 2016 (Trelleborg AB, 2016), and it since has a geographic concentration to central Europe although it is represented globally. TWS specialises in tires for off-highway vehicles. The annual sales are approximately 10B SEK (Trelleborg AB, 2019a, p. 89).
- *Trelleborg Sealing Solutions (TSS):* TSS is the largest and most profitable BA. TSS specialises in polymer-based sealing solutions, e.g. gaskets and O-rings. The annual sales are approximately 11B SEK (Trelleborg AB, 2019a, p. 89).
- *Businesses under development:* All business units with weak profitability were reorganised as "Businesses Under Development" during the restructuring of the Trelleborg Group's organisation in 2019. The BU's under this segment do not have any common product area. Their combined annual sales are approximately 3.4B SEK (Trelleborg AB, 2019b).

2.2 Purchasing at Trelleborg Group

Trelleborg Group combined has 23.000 suppliers with the majority concentrated in Europe, North America and Asia. The purchasing function also follows the outspoken decentralised strategy and purchasers are located to every BU (Trelleborg AB, 2019a, p. 56). The cooperation between purchasers is not forced but exists where opportunities of leveraging buying power are present, which mostly is within the BAs. Company-wide cooperation is only done on certain strategically important raw materials and 'lead buyers' are then selected to conduct the sourcing and negotiation of these materials. The lead buyers are often very senior purchasers with great knowledge within the supply market of the particular material.

Within indirect procurement the cooperation is not BU or BA specific, but rather geographical as there are 'country coordinators' to help source and negotiate larger contracts. The country coordinators are only present in the seven largest regions, and in the smaller regions purchasers manage their own sourcing.

A decade ago a Purchasing Excellence (PE) program was initiated at the Trelleborg Group and a PE Board was instituted. The goal was to boost value-generation for customers by improving processes at all BU's (Trelleborg AB, 2018). In the PE Board all BA's are represented by their respective purchasing VP and the VP of Group Purchasing acts as chairman. Through the PE program common KPIs were implemented in all BU's, the supplier communications were standardised and all purchasers were trained in using the Kraljic matrix for analysis of the sourced goods and services. Now the PE Board annually forms shared strategies and new knowledge is transferred across BA's. Also new initiatives, such as the eSourcing initiative, is created through the PE program to further develop the purchasing capabilities at the Trelleborg Group.

3 Theoretical framework

The theory framework built in this chapter will develop a fundamental understanding of the purchasing and sourcing process. The models presented will serve as the foundation for the analysis in the later chapters of this thesis.

Specifically the chapter will cover what digital sourcing processes look like and how these might differ from the traditional process. The aspects and situational factors which are important to assess when choosing among several available sourcing approaches are then introduced and identified from relevant literature. Lastly the elements which need to be assessed and configured in an eRA event are similarly identified from equivalent literature. Figure 3.1 schematically describes the reasoning of developing the needed theoretical framework for this thesis.

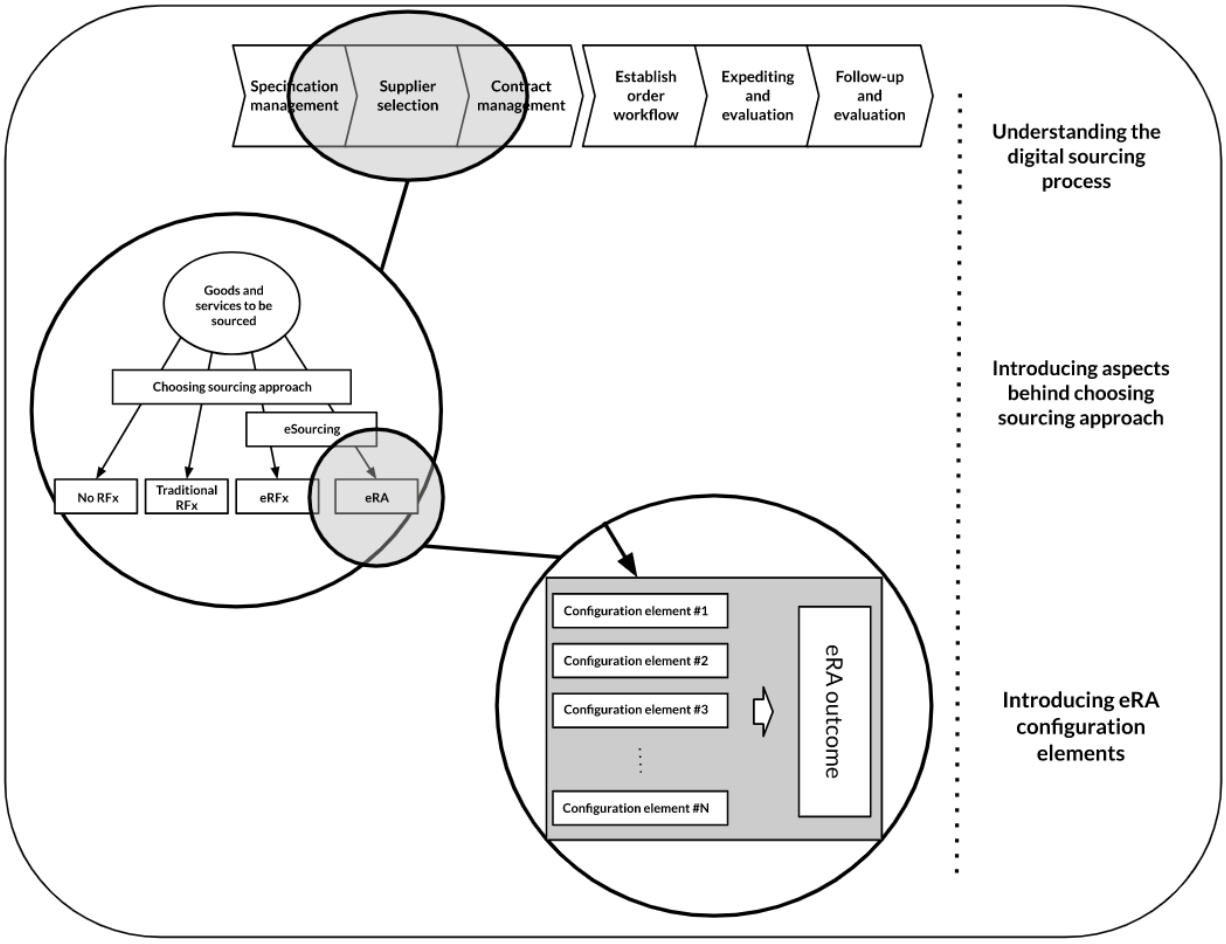

Figure 3.1. The focus of the thesis' theoretic literature review.

The theory chapter is lastly summarised with the main insights needed in order to continue with the case studies. The summary is also used to highlight the important parts in theory to further focus the reader on the two research questions.

3.1 Understanding the digital sourcing process

As eSourcing platforms have affected the prerequisites for how sourcing processes are conducted, it is important to understand the implications which an eSourcing implementation has on different parts of the traditional sourcing process. This will be done by firstly covering the basics of how the traditional sourcing process is usually defined and then elaborating on how digital sourcing approaches have changed these definitions.

3.1.1 Traditional sourcing process

For a manufacturing company, substantial supply chain improvements can be achieved by optimising the procurement and sourcing domains and its corresponding processes. This saving potential derives from the correlation between supply management performance and the majority part of a supply chain's expenditure (van Weele, 2002, p. 20), as well as the effects sourcing decision-making can have on the overall cost of quality (van Weele, 2002, p. 103). Drawing upon such opportunities of achieving purchasing savings is however not an easy accomplishment in large corporations. It requires both a uniform understanding of traditional purchasing process fundamentals, as well as what opportunities have recently been introduced by the ongoing purchasing digitalisation trend.

The purchasing process is not a universally defined process. In recent research by Bäckstrand et al. (2019), 73 unique purchasing process models used by practitioners and educators globally were found. These were categorised into: decision-making processes, linear processes, strategic processes, cyclical processes and hybrid linear-cyclical processes. According to their research, the most wide-spread model across all the 73 purchasing process models is the linear process first proposed by first introduced by Arjan van Weele in 1996 (Bäckstrand et al., 2019). Figure 3.2 shows the refined process version presented by van Weele (2014). This model will be used and adapted throughout the rest of the thesis, as it is the most commonly used and recognised operating model for purchasing organisations and practitioners. Thus adaptations need to be made to make it applicable in the more digitised eSourcing setting.

The purchasing function is the connection between the internal customer and the supplier. When experiencing an internal demand, the company is faced with a make-or-buy decision. Which products or services should be performed by the company itself and which should be contracted out. If choosing the latter the purchasing function is engaged and the six-step process starts. The distinct gap after the third step "Contract agreement" marks the shifts from a strategic and tactical view in the sourcing process into a more operative and transactional workflow in the supply of goods. (van Weele, 2014, p. 8)

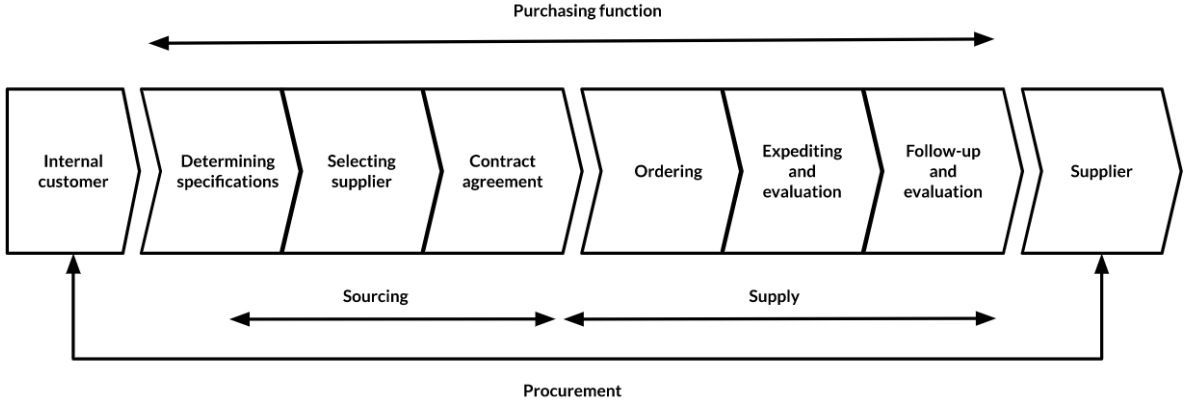

Figure 3.2. Traditional purchasing process model (based on van Weele, 2014, p. 8)

The first three steps of van Weele's linear purchasing process is defined as sourcing. The traditional sourcing process starts with determining the specification of the product that will be bought, based on the internal customer demands and how complex they are. The preferred situation for the purchasing function is when specifications are broad and functional, instead of technical. A functional specification defines the functionality which the product must achieve for the user, while a technical specification defines the exact technical properties and characteristics of the product. Maintaining a technical specification limits the purchasing function, but in certain rare situations a technical specification might not be negotiable at all. Customers might demand specifics as the country-of-origin, industry certifications or that only

approved sub-suppliers are used. These specifics then result in sourcing situations where the buyer is locked in with specific suppliers or supplier segments (van Weele, 2014, p. 32). It is further mentioned that the user or budget-holder is typically responsible for specifying order requirements. Meanwhile, the buyer's task is to ensure that the specifications are drawn up in objective and supplier-neutral terms to enable availability of the largest supply market possible. A common practice in the manufacturing industry is to facilitate internal sign-off procedures in order to improve the cross functionality in regards to how specifications are drawn up and finalised (van Weele, 2014, p. 33).

The supplier selection phase typically starts with category spend analysis and supply market research (as described later in a separate section covering category management practices in purchasing). If the product line is new and innovative the supplier base might be unknown and thus a lot of research is needed at the same time as the category spend would to a great extent have to be anticipated. Van Weele (2014) calls such situations "new-task" sourcing situations, and emphasises its palpable risk aspect. But oftentimes the purchaser has a sufficient knowledge of supplier base and relatively good overview of category spend already in place due to recurring sourcing cycles and is thus able to conduct a straight or modified rebuy. Straight or modified rebuys are sourcing processes done, based on current existing product knowledge and supplier base (van Weele, 2014, p. 30-35). Although stating that supply market research and spend analysis are important aspects of selecting suppliers in an informed way, van Weele (2014) does not summarise what effect these aspects have on the different sourcing approaches available with regards to the supplier selection phase, but rather lists a series of sub-steps upon which supplier selection is traditionally based as seen in Figure 3.3.

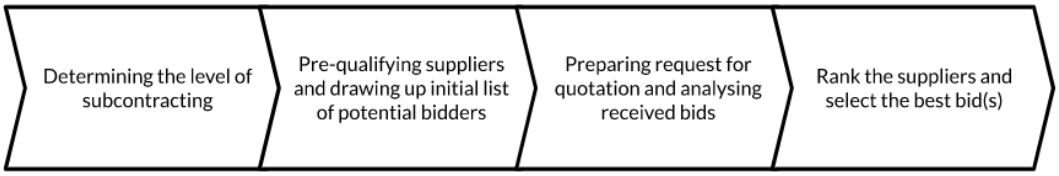

Figure 3.3. Traditional supplier selection process (based on van Weele, 2014, p. 31).

Similar to the make-or-buy decision, the buying organisation needs to decide whether to fully outsource an entire contract to the same supplier (through turn-key contracts) or dividing the assignments into parts which are contracted separately. For each contract, a long or short list of pre-qualified suppliers have generally served as the overview of suppliers that could potentially supply the needed goods or services. The pre-qualified list is based on qualification requirements which stem from the specification determined in the previous step, conducted market research as well as previous experiences with suppliers and the corresponding vendor rating scores. Supplier screening and selection are usually based on a competitive market exercise which is usually referred to as RFx, which is a collective abbreviation of different supplier requests: e.g. request-for-information (RFI), request-for-proposal (RFP) and request-for-quotation (RFQ). Each supplier on the pre-qualified initial list is sent an RFI or RFP. If a supplier is not previously known, they are contacted and asked to provide references or other information to help them qualify (van Weele, 2014, p. 34-35). When all the suppliers which qualify for the next step are sorted out, an RFQ can be initiated. Initial RFx answers are analysed and the most promising suppliers are selected to a short list. When creating the RFQ the most important aspect is that the RFQ should be constructed in such a way that the suppliers bids can be compared. After receiving the quotations the purchasing professional will evaluate the suppliers preferably on the total cost of ownership (TCO), and not only the specific price per unit. Ranking schemes may be used to evaluate the supplier bids (van Weele, 2014, p. 35).

The last step is to select the supplier(s), starting with a risk analysis to understand if single, dual or multiple sourcing is needed. This assessment typically depends on category based factors (as also described in a separate chapter covering purchasing category management). After analysing the risk aspect one or more suppliers are selected to receive the assignment.

All suppliers participating in the RFQ which are not selected are still informed about the rejection of their proposals and quotations. (van Weele, 2014, p. 35)

A detailed RFQ would have most aspects covered in the contract, but in the contract certain additional details are important to consider which can sometimes be too complex to include in the RFQ. Especially the terms of payment, such as if the product is to be paid up front or split into sections after completion or paid after receiving the goods. Penalty clauses and warranty conditions can be further agreed upon, to simplify the process of any later disagreements. If the contract is drawn up between entities from different countries the contract should state which legal system it is subject to. All this and other arrangements should be negotiated and agreed upon, and the final terms will then state the price or contract value. This final negotiating step is schematically illustrated after the supplier selection phase by van Weele. (van Weele, 2014, p. 36-38)

However, the situational interpretation of how and with which level of detail these three initial sourcing steps of the van Weele's purchasing process are to be carried out usually depend on what the sourcing situation looks like. Rajala (2019) highlights three different sourcing situations, each with different contextual attributes which in turn affect how its corresponding sourcing project is carried out as described below:

1. *Strategic sourcing:* The sourcing for majority of a company's purchasing operations. Sourcing activities which are planned long time in advance and where the sourcing project lead times are long. Except for availability and price, strategic sourcing projects are oftentimes analysed from a larger TCO perspective. A strategic sourcing model further encourages supplier communication and aims to keep such communication open throughout the contract lifecycle.
2. *Tactical sourcing:* The sourcing which is used to get items required to keep the business running or those that allow an employee to perform their job. With this approach, organisations still use certain criteria to make their sourcing decisions (but fewer than that of a strategic sourcing approach). The main factors considered during a tactical sourcing decision are price and availability of delivery dates, since the purchases are made based on need. Each transaction is often treated as a separate occurrence and they generally maintain a short-term approach.
3. *Spot sourcing:* Sourcing situations which to some extent lack the element of planning. More often than not, it is performed by the end user rather than a procurement professional. Such purchases are often based on one-time requirements and are often performed on an immediate payment and delivery basis.

3.1.2 Digital sourcing process

With the rise of digital sourcing platforms, oftentimes called eSourcing, the traditional view on sourcing has been subject to a few process changes which are relevant to mention. Firstly, digitalisation in general has introduced a simplified interface where supplier communication channels and corresponding data are more easily accessible and concentrated in one place (van Donk et al., 2008). Furthermore, eSourcing platforms have amplified this effect and hence supplier performance can more easily be analysed, evaluated and compared continuously throughout the sourcing process which shortens the external feedback loops (Schoenherr, 2019, p. 12). As feedback loops have become shorter, both in the sourcing steps and throughout the entire purchasing cycle, suppliers are more often exposed to an increased market transparency which can have very beneficial effects for industrial buyers in their sourcing processes (Beall et al., 2003). Since comparisons among screened suppliers is simplified and since eSourcing platform events are often strictly time-based, negotiation lead times have a tendency to decrease when transitioning away from the traditional phone- and email-based sourcing methodologies (Arnold et al., 2005; Carter et al., 2004).

ASP facilitated sourcing and procurement modules can have a restructuring effect on how industrial buyers source and procure goods and services (Neef, 2001, p. 62-64). Figure 3.4 illustrates how Van Weele's traditional six step purchasing process in its digital format was early divided into two separate components, *eSourcing* and *eProcurement*, both of which consequently has gotten different managerial focus (IBX Group, 2009).

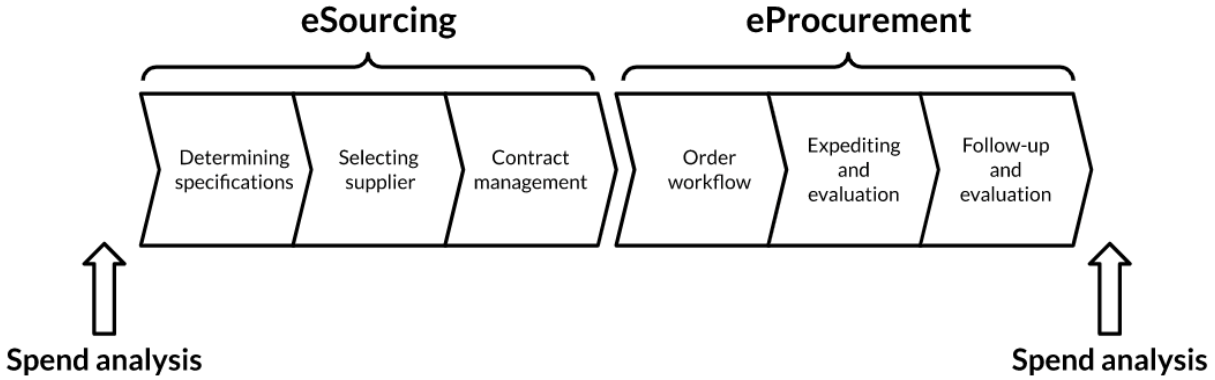

Figure 3.4. Industrial purchasing process in its digital format (based on IBX Group, 2009)

Table 3.1 by Schoenherr (2019) highlights how eSourcing related functionality encompasses more strategic modules, whereas eProcurement related functionality is typically more operational and related to purchase transactions or the triggers of material flow. The focus in eProcurement oriented solutions has lately been on efficient procure-to-pay workflow and organisational compliance. Procure-to-pay solutions have also introduced procurement process automation through intelligent order expediting and account reconciliation software support, often in close conjunction with interfaces and processes used by finance divisions (Schoenherr, 2019; IBX Group, 2009). Digital sourcing does however still maintain a more strategic dimension in its recurring complex decision-making characteristics. The complexity typically relates to how material or service category strategies are developed (IBX Group, 2009). Such category strategies typically address how and when the appropriate strategic sourcing approach and tools for sourcing projects within that category are chosen. Digital sourcing processes also tend to need more managerial attention when detailing recurring process designs and performing iterative spend and supply market analysis (Arnold et al., 2005; Carter et al., 2004; Beall et al., 2003; Emiliani, 2000).

Table 3.1. Typical modules in an eSourcing/eProcurement platform (Schoenherr, 2019)

Strategic modules (eSourcing)	***Operational modules (eProcurement)***
eSourcing and reverse auctions	Requisition management
Spend analysis	Purchase order management
Supplier performance measurement and management	Catalogue management
Contract management and compliance	Invoice management

Additionally, most often both the eSourcing and eProcurement suites of today are offering more than one of the modules listed in Table 3.1. As is the case with most consolidated B2B software markets, bigger eSourcing and eProcurement ASPs can offer more or less fully integrated solutions to cover the needs of the entire purchasing function and their corresponding processes (Schoenherr, 2019, p. 97).

The latest trends within such full suite sourcing and procurement solutions are source-to-contract, procure-to-pay or the more seamless source-to-pay process structure which takes an end-to-end approach to the purchasing process as illustrated in Figure 3.5. These terminologies are typically used in a more IT integrated structure, where the company strives for more seamless processes and a greater extent of automation within sourcing and procurement (Jain & Woodcock, 2017). However, it should be noted that eSourcing was early

identified as one of few B2B software technologies that also works well in a decentralised IT structure without the necessity of being integrated with ERP systems (Beall et al., 2003).

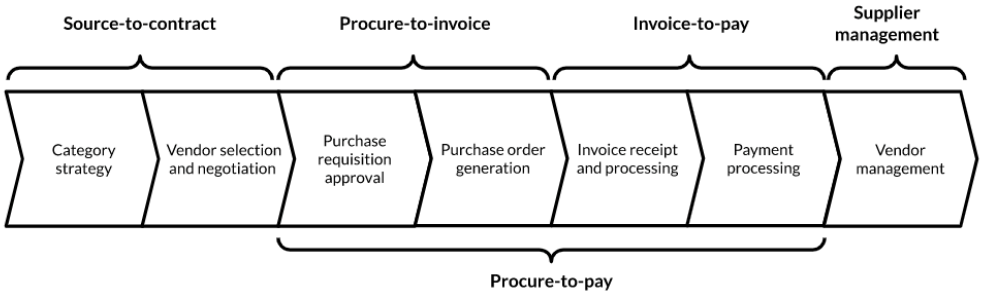

Figure 3.5. Source-to-pay process structure (based on Jain & Woodcock, 2017).

Comprehensive understanding of the roles that certain critical emerging technologies will play in the end-to-end digital purchasing processes is important, according to Jain & Woodcock (2017) from McKinsey & Co. The critical emerging technologies, and how these can correspond to different parts of the digital source-to-pay process structure, are:

- *Robotic process automation (RPA):* a technology which emulates simple tasks through simple logical rules. Robotic refers to that there is no room for interpretation within the process automation and that the bots only need to enter other software the same way a human user would. RPA is typically part of the more transactional and simpler steps of procure-to-pay modules (such as invoice upload/approval or simple integration between otherwise isolated IT systems).

- *Machine-learning algorithms:* a technology which, contrary to RPA, can automate more difficult decision-making situations which require more complex logical rules and pattern-recognition. Such decision-making situations have traditionally required human judgement and context-specific analytical capabilities, but the technological advancements within AI and machine-learning have lately expanded the automation potential for such process steps. An example of a purchasing related task which can be automatically deducted by machine-learning algorithms is assignment of transactions to a specific spend category. In other words machine-learning can further develop the foundation of an organisation-wide spend analysis. Machine-learning algorithms can also be deployed to automatically guide, track and monitor performance for organisation-wide negotiation practices with different category and supplier specific settings.

- *Smart work-flows:* a technology which can link tasks performed by different people and machines into a coherent process with well-defined responsibility handoffs. The technology works accurately independent of context-specific parameters and as a result it can handle e.g. risk management assessments for supplier qualification processes or guide specification management processes between R&D and purchasing divisions.

- *Natural-language-processing (NLP):* a technology which is based on automatic processing of textual data which can e.g. provide purchasers with a convenient way to document requirements in a more standardised format without resorting to drop-down menus or structured lists within a cross-functional system interface.

- *Cognitive agents:* a technology which can be deployed whenever a deep knowledge base must quickly be searched to determine the right course of action. Potential applications so far include help desks and chatbots. But it is anticipated that cognitive agents in the future will account for more complex tasks such as making comparisons among supplier capabilities as basis for automatic recommendations for which suppliers to select in a source-to-contract process.

Jain & Woodcock (2017) argue that there is potential to automate nearly 60% of the activities within the source-to-pay process structure. Meanwhile, developing spend-category strategies and selecting and negotiating with suppliers in the source-to-contract process structure is still described as more complex activities which over time will most likely remain hard to fully automate. Some of their sub-steps however are still argued to be at least partially automatable, mainly through machine-learning and cognitive-agent capabilities. In addition to the core source-to-pay sub-processes, vendor management and master-data management is further highlighted as good support when tapping into the value stream of the end-to-end system facilitated purchasing process (Jain & Woodcock, 2017).

Transitioning sourcing into ASP provided eSourcing platforms introduces a more structured marketplace with several new available sourcing approaches in the form of various sourcing process components such as eRA events and single- or multi-event eRFx (Schoenherr, 2019, p. 88). The formats for each eRFx or eRA event can be more or less predefined inside the eSourcing platform. Most often events can be cloned for repeated sourcing cycles to increase the sourcing process efficiency over time as well as making it easier to run several parallel events to improve sourcing productivity. The ability to clone sourcing events in the eSourcing platform and to maintain a process workflow overview among these (as well as easily adjusting event parameters) can be argued to be hard to achieve when facilitating the sourcing processes merely through email. Another important aspect of performing sourcing processes in ASP provided eSourcing platforms is that it enables multiple coworkers to parallelly work on the same sourcing process, whereas the process visibility of operating through an email client is significantly worse compared to eSourcing platforms (Beall et al., 2003; Carter et al., 2004; Schoenherr, 2019, p. 88)

It should be noted that conducting RFx has a market research effect in itself. The type of request which should be sent out differs depending on how early into the purchasing process the purchaser is. Without an eSourcing platform, these types of requests are typically sent by email. Within an eSourcing platform however, the supplier information from these events are gathered in one place and can more easily be used again in later sourcing processes. Furthermore, an esourcing platform typically introduces an easily managed interface for such platform-based RFx (eRFx) processes, which has the potential to facilitate a more extensive supplier selection scope compared to traditional sourcing. Traditionally a short list consisted of the three to five most prospective suppliers. Whereas with eSourcing methodologies such a short list can remain efficient while consisting up to 20 suppliers depending on the sourcing situation, as seen in Figure 3.6. (IBX Group, 2009)

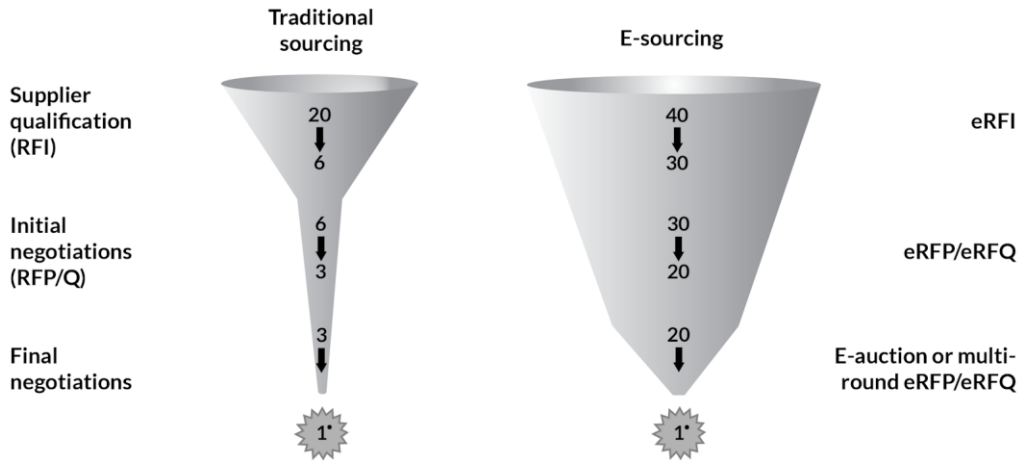

Figure 3.6. Increased sourcing competition among suppliers with eSourcing. (based on IBX Group, 2009)

Arnold et al., (2005) made chronological process comparisons between a traditional sourcing process of only communicating company-to-company parallelly with several suppliers and to that of a competitive sourcing process including eRAs, as seen in Table 3.2. A glance at their process comparison highlights three relevant differences. Firstly, identification of opportunities to conduct eRAs requires more extensive "fitness" analysis, compared to traditional sourcing approaches. Such "fitness" analysis consists mainly of a contextual assessment of its applicability. Secondly, eRAs require more preparatory work in order to create comparability in the bidding process, so that it is easier to evaluate bids from a broad participating supplier base. The preparatory work needed for initiating all participating suppliers to the eRA sourcing process was also emphasised. Lastly, an eRA sourcing process was argued to require more feedback dialogues, both internally and externally, to ensure internal process compliance as well as maintaining healthy buyer-supplier relationships throughout the supplier base (Arnold et al., 2005).

Table 3.2. Differences between traditional and eRA sourcing processes (Arnold et al., 2005).

Process steps	Traditional sourcing process	eRA sourcing process
Problem analysis	Strategic analysis	Strategic analysis
		"Fitness of approach" analysis
Specification	Technical requirements	Technical requirements
	Commercial requirements	Commercial requirements
Supplier pre-selection	Identify suppliers	Identify suppliers
	RFI, RFP	eRFx
	Narrow down the list of suppliers	Narrow down the list of suppliers
	Contact the suppliers	Contact the suppliers
	Selection of potential suppliers	Selection of potential suppliers
	Technical pre-dialogues	Technical pre-dialogues
Preparation	Prepare for negotiation	Define and weight TCO variables
	Prepare and send documents	Define the auction design
		Invite suppliers
		Prepare and send eRA documents
		Suppliers instruction, test auctions
Negotiation	Evaluate the offers	Hold the eRA
	Negotiation session(s)	Extend the closing time
		Post-eRA negotiation session(s)
Evaluation	Qualify supplier(s)	Qualify supplier(s)
	Award the business to supplier(s)	Award the business to supplier(s)
	Documentation	Feedback dialogues
	Controlling	Documentation
		Controlling

3.2 Making informed decisions regarding sourcing approaches

As eSourcing platforms have introduced new approaches by which the buying company can source goods and services, the complexity in choosing among such sourcing approaches have simultaneously increased. Being able to make informed decisions regarding which sourcing approach to use and ensuring that the chosen approach fits the context consequently increases in relevance. Such informed decision-making requires a series of enablers according to the major consultancy firms McKinsey & Co, Boston Consulting Group and A.T. Kearney (Jain & Woodcock, 2017; Högel et al., 2018; Schnellbächer et al., 2018; Ericson & Brandyberry, 2010). Relevant enablers include:

- *The data infrastructure needed to analyse category and supplier structures is in place*
- *Insights of how emerging technologies will deliver improved purchasing performance*
- *Organisation-wide identification and analysis of category and supplier structures*
- *The necessary digital sourcing roles and capabilities are deployed and empowered*

Once the utilisation of eSourcing technology has been enabled throughout the organisation, new digital sourcing approaches are introduced. Then comes the question of when to use each approach and which aspects to analyse before making an informed decision.

3.2.1 Enabling the data-driven digital sourcing transformation

Högel et al. (2018) emphasise that a big part of preparing for sourcing and procurement digitalisation will mean realising the current boundaries of legacy systems and their inherent data infrastructure. More often than not, the current data infrastructure might have to be modified to sustain adequate insights to the category spend as well as how it is divided over the corresponding suppliers. Högel et al. (2018) further pinpoint that the broad range of procurement and sourcing suites, portals and applications available today is a good gateway to taking the needed control of the data infrastructure to get the needed company-wide overview of category and supplier spend. Meanwhile, Schnellbächer et al. (2018) states that enabling data-driven digital sourcing transformation requires that the digitalisation effort is embedded into the overall business and procurement goals and strategies.

Figure 3.7 by Högel et al. (2018) illustrates how different steps of the purchasing process are augmented if source-to-contract and procure-to-pay suites are added to the system structure. It is subsequently through each suite’s multi-purpose technologies that the true digital purchasing values can be created (Jain & Woodcock, 2017; Högel et al., 2018).

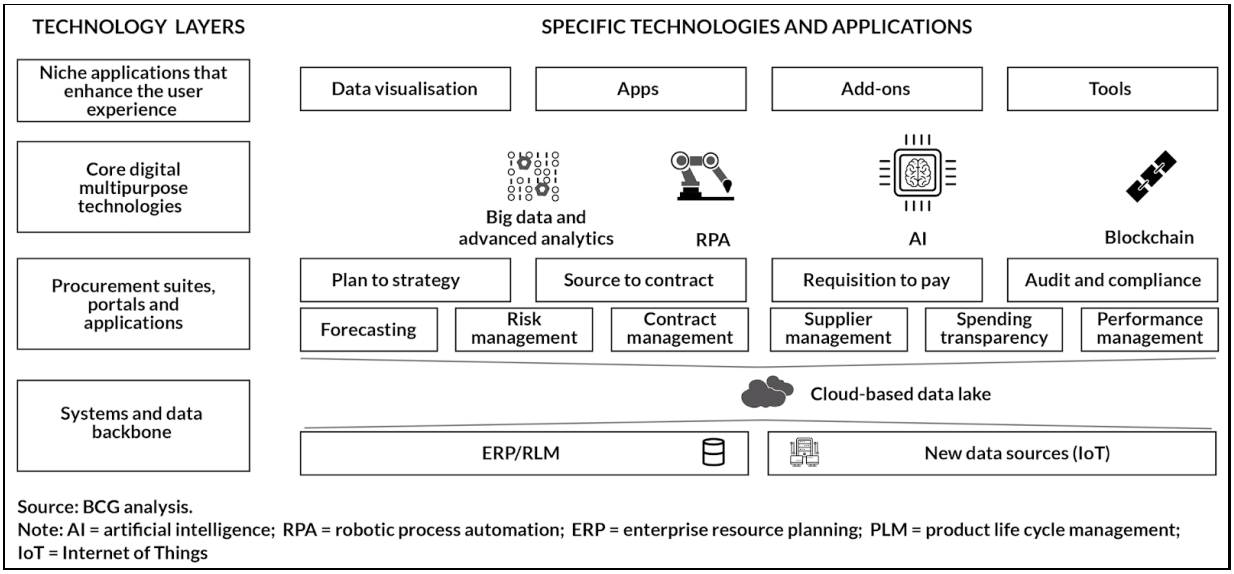

Figure 3.7. Four layers of digital purchasing technology. (based on Högel et al., 2018)

3.2.2 Developing category management practices

In regards to choosing the appropriate sourcing approach, IBX Group (2009) emphasised the need of conducting spend analysis in order to create adequate insights into the company category spend and consequently being able to make the correct strategic sourcing decisions. It is argued that spend analysis should be done both prior to a sourcing process as well as during the later follow-up and evaluation steps of an entire purchasing process in order to find opportunities to realise savings. An important step of evaluation is to look into how the spend for a specific supplier or category has developed over time (Arnold et al., 2005; IBX Group, 2009).

Similarly, Rendon (2005) discussed how opportunities of improving purchasing performance can be neither identified or acted on prior to conducting extensive spend analyses and profiling previously purchased goods and services into fitting category segments. Adequate categorisation is commonly based on spend characteristics and level of specification complexity. Furthermore, the importance of conducting supply market analysis in order to identify industry trends, changes in the supply market as well as level of supply market leverage is pinpointed. The combined category profiles and supply market analyses are argued to be a good foundation for developing organisation-wide strategies of how to acquire desired goods and services, as seen in Figure 3.8. (Rendon, 2005)

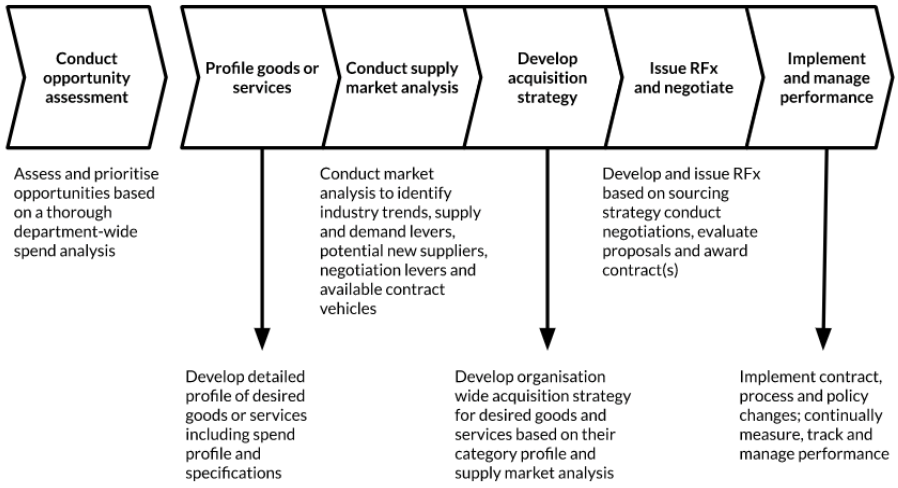

Figure 3.8. Strategic sourcing process (based on Rendon, 2005)

The most fundamental distinction between spend categories is generally made between direct and indirect materials (Neef, 2001, p. 25). Organisations typically arrange their cross-functional teams (particularly the purchasing organisational structure with e.g. category managers and their corresponding processes) around either the direct or indirect purchasing categories. This simplifies identification of potential similarities and opportunities to achieve purchasing synergies within each category (O'Brien, 2019, p. 24).

Direct procurement, i.e. procurement of all materials and services for the production of the finished goods, usually has its focus on ensuring flow of material with low risk of supply disruption, from a pool of pre-selected suppliers procured at the best possible mix between cost, quality and reliability (van Weele, 2014, p. 6). The range of complexity as well as the need for cross-functional collaboration between purchasing, production and engineering units can often vary drastically between different direct purchasing segments when determining demand specifications (Rendon, 2005).

Conversely, indirect procurement handles all the materials and services purchased that does not directly involve the company's core operations. It is all the necessities of the workplace, things that tend to be of low value but purchased in large volumes. Indirect procurement typically accounts for 60-80% of all purchasing transactions (Neef, 2001, p. 25). Furthermore, indirect spend category is often assigned cost contributions from both non-essential goods such as office supplies as well as more mission-critical goods such as plant spare parts (Neef, 2001, p. 26). Thus a company typically needs more in-depth purchasing categories. Indirect procurement can e.g. be sub-categorised by distinguishing the ORM (operating resource management) category which contains for example ordinary office products and services, from the MRO (maintenance, repair and operations) category which typically contains mission-critical overhaul and maintenance items (Neef, 2001, p. 26).

Cox et al. (2005) summarised a set of internal and external strategies (see Table 3.3) which focused on how a company can improve its category management practices in indirect procurement. The strategies can to a great extent also be transferred to direct material, with the exception of that there is a bigger need of cross-functionality in specification management practices related to direct procurement due to the close link to the company's value added.

Table 3.3. Internal and external category strategies for indirect categories (Cox et al., 2005).

Internal strategies	***External strategies***
Internal strategy 1: Influencing the design and specification process for indirect goods and services by other functions within the organisation.	**External strategy 1:** Increase leverage through the development of external short-term sourcing strategies (such as reverse auctions and constant rebidding).
Internal strategy 2: Taking over the buying role from other functions in the organisation, without impacting directly on design and specification.	**External strategy 2:** Increase leverage through the development of external long-term sourcing strategies (such as collaborative partnerships with preferred suppliers).
Internal strategy 3: Influencing design and specification and undertaking the buying role for other functions in the organisation.	**External strategy 3:** Increase leverage through the development of external consortia sourcing arrangements with other organisations to provide volume leverage.
Internal strategy 4: Working with other functions in the organisation to develop their procurement competence, through joint training programs and/or the creation of procurement-led audit and governance processes.	**External strategy 4:** Increase leverage through outsourcing the external sourcing responsibility to third-party providers of indirect sourcing competence to provide volume leverage.
Internal strategy 5: Making improvements in the internal competence of the procurement function in an attempt to develop its ability to influence other functions in the organisation.	

Considerable parts of the indirect spend segments can further be identified as independent of the industry type or business area (O'Brien, 2019, p. 24; Neef, 2001, p. 26). Thus it can sometimes be easier to realise indirect purchasing synergies across different business areas or units for indirect categories, compared to direct categories which often require more complex

and business area dependent demand specifications. One must be mindful, as it can be detrimental for the sourcing performance to lump together goods and services with wide differences in their role and characteristics into the same category (Rendon, 2005), since items within the same category tend to get about equal amounts of analytical and strategic focus. However, time is a limited resource and thus categories known to have a big impact on business performance and the competitive advantage should naturally get prioritised attention by purchasing analysts as well as strategic management.

The need for further supply categorisation was one of the underlying reasons behind the upsurge of analytical tools and approaches aimed at making the previously clerical purchasing function into a part of a company's strategic management. This category management focus started before the 1980's, but in 1983 Kraljic released his pioneering work upon the importance of increasing strategic attention to the purchasing function. His work came with a framework for developing supply strategy, including what is since referred to as "the Kraljic matrix". In the matrix, which is depicted in Figure 3.9, Kraljic proposed that the supply strategy which a company should strive to implement mainly depends on two factors (Kraljic, 1983):

1. the strategic importance of purchasing for the company;
2. the complexity of the company's supply market.

When assessing the strategic importance of purchasing, value added by a product line and the purchasing spend as a percentage of total cost needs to be looked at to get an idea of what impact purchasing has on product line profit (Kraljic, 1983). The complexity of a supply market is determined by its entry barriers and supply scarcity, if there are monopoly or oligopoly market tendencies, its technological pace and the general opportunity for material substitution (Kraljic, 1983). The four quadrants enables categorisation and different strategies depending on which quadrant a product or service was segmented to.

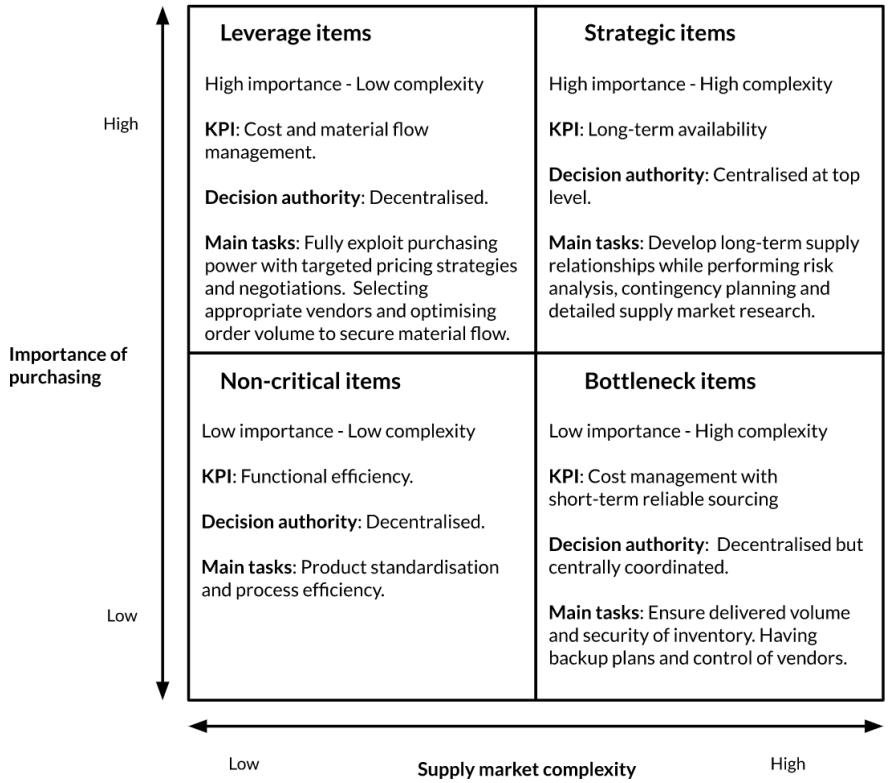

Figure 3.9. The Kraljic matrix (based on Kraljic, 1983)

In terms of assessing supply market complexity, there are no generally correct answers to how it should be done. O'Brien (2019) argues that supply market understanding can be achieved by conducting PESTLE analysis as described in Table 3.4 combined with a purchasing oriented Porter's five forces analysis as illustrated in Figure 3.10.

Table 3.4. Factors and components of PESTLE analysis (based on O'Brien, 2019, p. 172)

Factors	***Questions, risks, opportunities and forces associated with market change***
Political factors	Political stability, level of regulation, governmental approach, etcetera
Economical factors	Tax, currency and inflation rates, public expenses, confidence from customers, etcetera
Sociological factors	Social trends, demographics, socio-ethical aspects, etcetera
Technological factors	New inventions, emerging technologies, technological barriers, etcetera
Legal factors	Regulation, legislation, union strength, corporate practices, etcetera
Environmental factors	Sustainability, carbon footprint, recycling and decreased waste and use of natural resources, etcetera

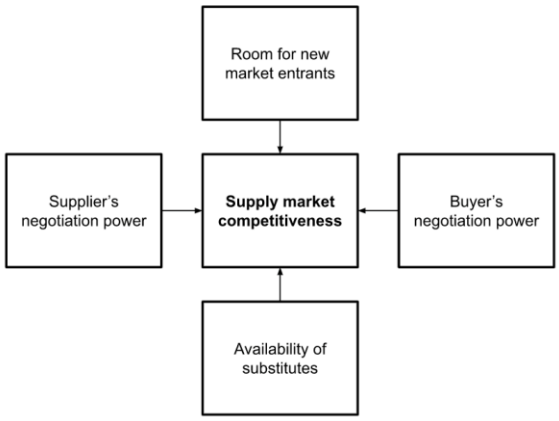

Figure 3.10. Porter's five forces applied to purchasing's market analysis (based on O'Brien, 2019, p.174)

Kraljic (1983) initially introduced his matrix while suggesting that spend and supply market analysis was to be done based on the above mentioned *item* characteristics. However, it has since been pinpointed that such spend analysis should be done both per category as well as per supplier (Rendon, 2005). Furthermore, a spend analysis should be mindful of the TCO, and not just the purchase price of the supply or service alone. Spend analysis should also try to reflect the various end-users throughout the organization in order not to make sub-optimal commodity categorisations (Rendon, 2005). Ultimately, spend and supply market analyses should be used to develop purchasing portfolio management practices (Kraljic, 1983) as well as organisation-wide (or at least business area-wide) acquisition strategies for the desired goods and services (Rendon, 2005).

An important thing to assess in regards to the competition on the supply market is the relative power balance between the buyer and supplier. Buyer-supplier power balance includes e.g. negotiation leverage, visibility and information about price components and relative company sizes. Items with particularly complex supply market characteristics are especially interesting subjects to be analysed. It should be emphasised that all items with complex supply markets are not necessarily sourced from a position of weakness. The buyer thus consistently needs to make decisions regarding whether to use sourcing strategies based on supplier exploitation, diversification or a sound balance between the two (Kraljic, 1983). An overview of the decision-making logic in regards to relative power balance between buyer and supplier is described in Figure 3.11.

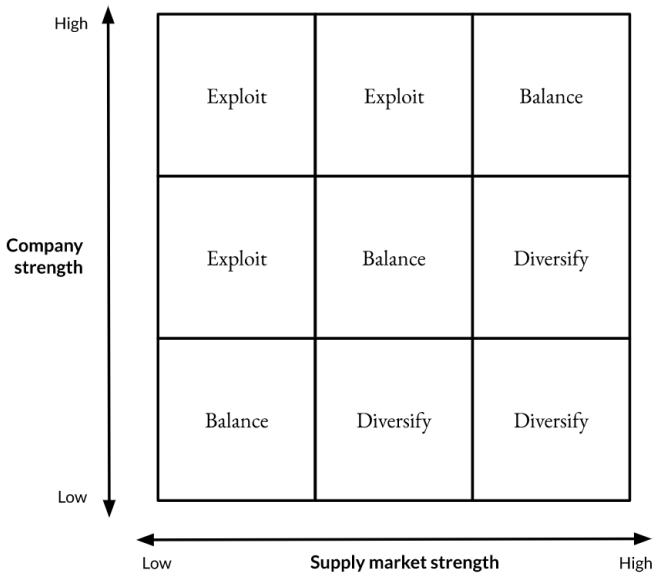

Figure 3.11. The purchasing portfolio matrix (based on Kraljic, 1983)

3.2.3 Supplier relationships and supply market analysis

The supply market and the relationship with current suppliers will affect the sourcing process. SRM is described as how a company can work together with their suppliers and create mutual strategies to achieve beneficial gains. This can be put in contrast with category management's internal focus on category and product strategies (Schuh et al., 2014, p. 5). Bensaou (1999) describes it as having a portfolio of buyer-supplier relationships where the purchasing organisation should employ different strategies, the author advises the different strategies to depend on how invested the buying organisation is in the supplier contra how invested the supplier is to the buying organisation.

Other categorisation of suppliers and respective strategies are available than the one presented by Bensaou (1999), the Kraljic matrix that has been extensively used in category management and has since also been used in SRM. For example, Gelderman & van Weele (2003) explores the Kraljic matrix and develops purchasing strategies for each quadrant, shown in Figure 3.12, with the aim to exploit buying power and reduce dependence of suppliers.

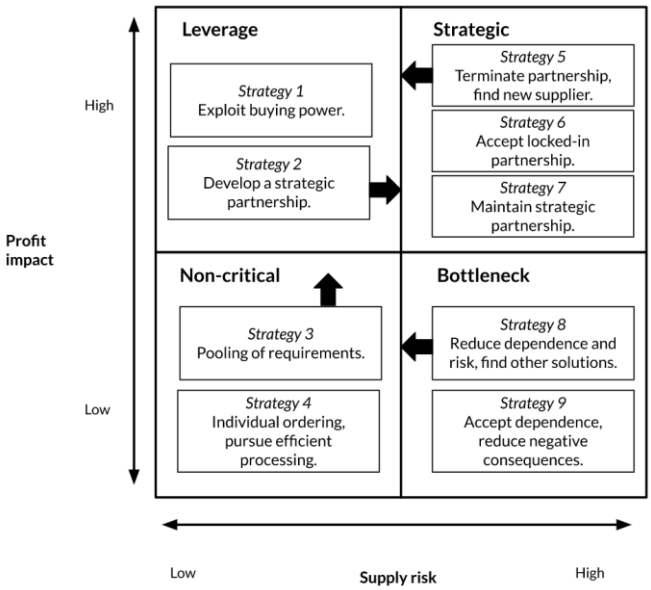

Figure 3.12. Purchasing strategies for different Kraljic matrix quadrants (based on Gelderman & van Weele, 2003).

The purchasing strategies from the different Kraljic matrix quadrants enable nine strategies to either maintain the position in a quadrant or to move into a different quadrant. The leverage position is generally the preferred position and the first strategy allows a command strategy where the buyer can dictate a rather aggressive supplier management with bidding and short-term contracts and only choosing partnerships of convenience. In rare occasions a second strategy of leaving the leverage position by developing a strategic partnership with a single supplier are sought after, this is only feasible with technologically advanced suppliers willing and capable of contributing to the competitive advantage of the buying company. The non-critical quadrant often has the largest number of suppliers and by bundling products and categories the profit impact can increase making it a leverage item. If no synergies can be made with bundling the process efficiency is pursued in order not to waste resources. Strategic partnerships could either be prosperous or the supplier has locked in the buyer, if a lock-in exists a strategy of trying to find alternatives exists in order to terminate and hopefully move into the leverage quadrant. In the bottleneck quadrant, the primary focus is to mitigate the risk of disturbances by reducing dependence upon suppliers. If it is not possible to reduce the supplier dependence within the bottleneck quadrant, strategies to limit negative consequences of supply shortage should instead be developed. The purchasing professionals should be able to analyse their supplier relationships and products to make decisions on fitting strategies for the respective quadrant on which they exist. (Gelderman & van Weele, 2003)

In their research, Gelderman & van Weele (2003) frequently touch upon certain category barriers which typically have the tendency to segment the category into either the strategic or bottleneck quadrant. Those barriers, which have a limiting effect on the possibility of conducting a competitive supply market exercises, are usually related to:

- Supplier lock-in situations
- Certification, approval or patent requirements
- The strategic partnership is mutually beneficial and has value impact (i.e. no need for supply market exercise)

One factor which strongly influences whether to initiate an RFx process or not both in new tasks and straight/modified rebuy sourcing situations is generally how many suppliers are available to source from. Additionally, in straight or modified rebuys there are existing supplier relationships or partnerships in place for the goods or services which are to be procured (van Weele, 2014, p. 33-35; Bensaou, 1999). There can also be situations where specific suppliers, specified quality levels or other intangible attributes have been locked in a downstream bill of materials or similar or where a buyer already is deeply invested with a specific supplier (Bensaou, 1999). What makes a sourcing approach appropriate therefore depends on both the general characteristics of the supply market as well as the already existing supplier relationships. This consequently means that the buying organisation needs to have well developed supply market scouting and SRM practices in place.

3.2.4 Establishing and empowering the necessary roles and capabilities

One of the essential components of leveraging digital value creation within procurement, as highlighted by Högel et al., (2018), is ensuring that the necessary sourcing and procurement roles as well as the adequate capabilities are in place. Master-data management will be crucial not only to actually being able to execute data analysis, but to make sure that the needed data can be easily acquired throughout the organisation in the correct formats. Thus, data scientists will be important for the digital organisation (Högel et al., 2018). It will further be important to understand that the future roles and tasks of tactical and operational purchasers might differ slightly from the traditional sourcing setup. That is because automation technologies are able to complete simpler clerical tasks, which frees up time for the sourcing professional to conduct more tactical and strategic activities (Högel et al., 2018; Schnellbächer et al., 2018). Additionally, category and key supplier managers are in the future required to be skilled in

digital technologies and how to use them in the specific context of their category or supplier relationship in order to optimise sourcing related value creation (Högel et al., 2018).

Similarly, Schnellbächer et al. (2018) highlight that people and capabilities as well as performance management are enablers of digital purchasing practices. But they also pinpoint that once implemented, digital solutions will in turn create a foundation for capability-building plans that buyers and managers alike can tailor to their context. Although digital will help people enhance their skills in certain ways, it will still require them to adapt their skills to the new technology landscape. It is however, as always, important to align the defined metrics which are being measured with the eSourcing goals and strategy. What is measured usually gets done. Thus it is important to have a very clear view of what the initial goals of implementing eSourcing technology was, in order to develop an effective eSourcing performance management setup. (Schnellbächer et al., 2018)

Rendon (2005) highlighted four strategic sourcing best practices from both department of defense agencies as well as prominent commercial companies, in regards to enabling and empowering the organisation to make optimal purchasing decisions. The identified best practices, all of which to some extent linked to the cross-functionality and common understanding needed to address complex specification management and overall reduction of organisational spend, were:

- *Common processes and tools*: The strongest critical success factor was the use of common processes and tools. The results are typically insights throughout the entire organisation regarding the what, who, where and when of organisational spending.
- *Cross-functional teams*: The cross-functional teams were educated and skilled in all aspects of the goods and services to be sourced. These teams understood all aspects of the value chain. Critical to establishing these teams is the inclusion of end-users and technical experts into the decision making process, improving the results substantially.
- *Team sponsorship and authority*: Holding the teams accountable for their own sourcing goals and giving them authority to make their own decisions was essential for the success of the commodity teams.
- *Managing ambiguous requirements*: Managing the requirements from several sub-units into one or more standardised configuration requirements typically receives negative responses. Here the team sponsor must take an active role to both manage leveraging the aggregate buying power as well as serving justice for maverick spenders.

3.2.5 Aspects critical to choosing suitable sourcing approaches

An important aspect of using eSourcing technology is the organisational understanding of the values and benefits which it brings about. It is a critical aspect as it governs the logic of moving an entire sourcing process from traditional face-to-face (F2F) and email-based sourcing processes into an eSourcing platform. Schnellbächer et al. (2018) presents the five purchasing values of savings, speed, risk, quality and innovation. All of which are positively impacted by a general use of eSourcing and digital procurement solutions. IBX Group (2009) highlighted reduced purchasing costs and shortened sourcing cycles as the core values which are gained through eSourcing. In the study from Ericson & Brandyberry (2010) eSourcing would create improvements in number of sourcing events, frequency with which sourcing events can take place, reduced cycle time of sourcing events, increased availability of templates and analytical tools, improving the consistency and quality of sourcing events and the ability to include more suppliers in the process. Improved visibility and transparency are further highlighted in research as aspects in favor of eSourcing technology (Schoenherr 2019, p. 14; Beall et al., 2003). Additionally, improved efficiency and productivity due to better sourcing workflow overview as well as recurring cloneable sourcing event designs are additional process oriented benefits of transitioning to eSourcing platforms (Schoenherr, 2019, p. 17; Beall et al., 2003; Carter et al., 2004). Even though the overall cycle times might be reduced for an eRA sourcing approach a

certain time to auction is needed for the practitioner to prepare, analyse and develop a strategy prior to the auction for it to be successful (Wagner & Schwab, 2004).

Organisational barriers are frequently discussed as an aspect which slows down the adoption and utilisation of eSourcing technology based approaches. Schoenherr (2019, p. 21) states that there are six general barriers of transitioning to an eSourcing platform, these are:

- *Implementation costs*: The cost of acquiring and implementing an eSourcing platform is significant and some companies do acknowledge the benefits but do not believe them to be valuable enough.
- *System capabilities*: Some companies have old legacy systems which the eSourcing platform might not be compatible together with. It will therefore be a barrier for implementing it.
- *Internal resistance*: The personnel that should adopt the eSourcing platform in their workflow might not appreciate the changes and stick to old habits. Sometimes actively resisting the changes by advocating the old routines but more often passively by not adopting any changes in the process.
- *Fear of reduced human interaction*: When adopting email and other digital tools many purchasers lost human interaction with the sales department of suppliers. By adding an eSourcing platform a fear of further reducing this interaction is a barrier for changing the process.
- *Security*: By putting all processes into an IT system the company is very vulnerable to attacks and/or downtime of the platform. Therefore security concerns exist when implementing an eSourcing platform.
- *Supplier limitations*: At some organisations their suppliers were limited with the technology, most suppliers today have access to internet but if not they are unable to participate. Additionally a few eSourcing platforms require software licenses for all users and small suppliers might not afford these fees for attaining such a software license.

IBX Group (2009) instead highlights the risk of slow eSourcing adoption when operational rather than strategic focus dictates how sourcing activities are carried out. The same goes for when there is no defined sourcing process in place throughout the company or when management commitment regarding the eSourcing initiative is insufficient. Such barriers are all typically prominent in decentralised purchasing organisations and need to be dealt with in order to get organisational traction in the eSourcing implementation (IBX Group, 2009).

Furthermore, there are additional barriers contextual for any given sourcing project, which limit the possibility of conducting competitive supply market exercises. Such competitive barriers are often identified when analysing category and supplier structures on a sourcing project basis and are typically derived from either supplier lock-in situations or complexity in fulfilling supplier approval/certification/patent requirements. It can also be the case that a mutually beneficial strategic partnership is in place and that there is therefore no need to conduct a competitive supply market exercise (Gelderman & van Weele, 2003).

Knowing the alternatives to a competitive sourcing process is an important aspect of making informed decisions regarding what sourcing approach to use. It is possible to go straight to F2F or email-based negotiations with a single supplier without scouting the market by for example an RFI inquiry first. This is what is done when the buyer opts, or is forced, to go for a straight rebuy (van Weele, 2014, p. 31). It can also be the case that specification complexity makes it hard to concretise and compare supplier's offers in RFx or eRA events. Forming strategic partnerships with technologically qualified suppliers could then be the most adequate way of sourcing (Bensaou, 1999; Gelderman & van Weele, 2003). The need to be flexible in supplier contact and negotiations in situations where demand specifications are complex can thus be seen as an aspect which promotes working with F2F and email-based negotiations and supplier relationship development with single or few suppliers. Highly competitive platform based procedures such as eRA put a bigger emphasis on price as well as other tangible and

comparable attributes, which can limit the supplier's ability to provide solutions to complex specifications in innovative ways (Arnold et al., 2005; Jap, 2007). Specification complexity among the products or services to be sourced might thus result in difficulties in regards to how suppliers are to be fairly compared on price alone in an eRA event (Rendon, 2005; Arnold et al., 2005).

What makes a sourcing approach adequate and efficient for a given sourcing situation is further governed by three important aspects, which individually are covered in previous sections. These are, without relative significance, the sourcing professional's insights regarding *category characteristics*, *supply market characteristics* and the *existing supplier relationship context*. IBX Group (2009) illustrated inside the Kraljic matrix how the first two of these aspects can dictate what makes the adequate sourcing approach, as seen in Figure 3.13. Easy to notice is that they suggested that eSourcing software in general is applicable to sourcing projects related to all segmentation categories inside the Kraljic matrix. For eRAs however, besides requiring a low complexity on the supply market, IBX Group (2009) further pinpointed three questions which are critical to ask when assessing the applicability and "fitness" of using eRAs as a sourcing tool:

- *Is the supply market competitive?*
- *Are the specifications precisely defined?*
- *Is the supply comparable and easily subject to substitution?*

In order to establish a broad and comparable supply base relevant and valuable for both eRFx as well as (and particularly) eRAs, stern specification management from the category management team is required (Arnold et al., 2005; Rendon, 2005).

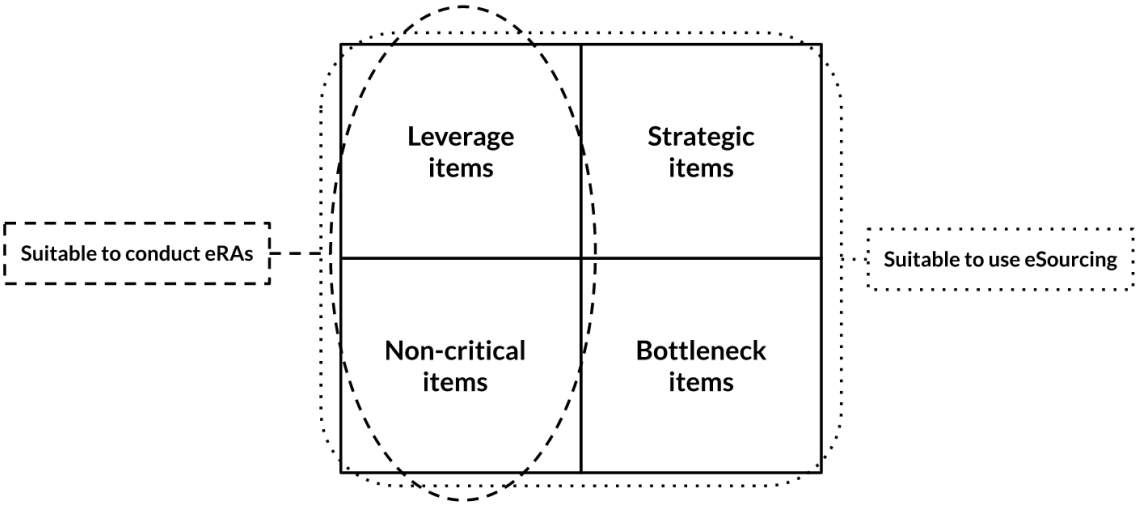

Figure 3.13. Digital sourcing approach "fitness" based on Kraljic matrix segmentation. (Based on IBX Group, 2009)

Emiliani and Stec (2002) introduced a critical view of conducting eRAs, based on existing supplier relationship structures. In their findings they identified risks of local optimisation tendencies, where the purchasing function lowered their costs but the TCO increased. It was highlighted that there were risks of adhering to the pressure for short term shareholder value rather than developing partnerships to increase long-term strategic value proposition with suppliers. The eRA could decrease the long term competitiveness of buyer and seller as it reinforces behaviour which degrades the current capabilities or discourages development of new capabilities. They conclude that long-term partnerships are better than eRA events to reduce costs. It should be noted that their conclusions were made under the assumption that the buying organisation was transitioning from long-term partnerships to more competitive sourcing processes including eRAs. (Emiliani and Stec, 2002)

Another aspect which is critical for the applicability of utilising the full arsenal of eSourcing platforms is the sourcing process structure and the available sourcing lead time. As previously mentioned, Arnold et al., (2005) highlighted three relevant differences between a traditional sourcing process and a competitive sourcing process including eRAs:

- The need for extensive “fitness of approach” analysis
- Preparatory work needed in order to create comparability in the bidding process
- Preparatory work needed to initiate all participating stakeholders
- The facilitation of feedback dialogues needed to ensure healthy supplier relationships

The mentioned differences all point towards that competitive sourcing processes which include eRAs require a more structured sourcing process. The available lead time under which such sourcing processes are to be prepared and carried out can also be a limiting factor.

3.3 Configuration of electronic reverse auction processes

The use of eRA has been widely discussed since its introduction in the mid 1990’s. This electronic marketplace phenomenon was a natural development of the more efficient and simplified digital interfaces enabled by the use of the internet as a means to optimise the sourcing process. More specifically an eRA event is when a professional buyer creates a temporary auction marketplace, usually on a platform provided by an ASP, to which suppliers are invited to participate in competitive bidding procedures for a set of goods or services which are to be supplied (Neef, 2001, p.64). The eRA tool allows for the buyer to optimise the marketplace setting with the goal of stimulating invited suppliers to challenge themselves to offer the best (lowest) possible price for the goods or services at a usually pre-defined set of contract attributes (Beall et al., 2003).

Due to the market power shift introduced by eRAs, it has become a powerful asset in industrial buyer’s mix of available strategic sourcing approaches, when there is a need to apply additional market leverage and to increase the market transparency in terms of product or service price (Neef, 2001, p.83). If the eRA tool is applied correctly, research suggests that the sourcing prices which it determines can imply significant sourcing spend reductions which are typically in the order of 10-40% as argued by Elmaghraby (2007) or even up to 50% as argued by Arnold et al. (2005). Meanwhile, some studies have shown that eRAs which are done with a high level of buyer commitment (i.e. without post-auction negotiations) result in up to 96% reduction in time spent in the negotiation phase (Arnold et al., 2005).

3.3.1 Identifying elements critical to eRA success

Once an opportunity has been identified to apply eRAs in a sourcing process, the question for the buyer comes down to what drives buyer success within eRA event. Success in eRA events (from the buyer’s perspective) was early defined as “negotiation process outcome derived from use of eRAs which exceed the expected or perceived savings of a F2F negotiation or a traditional sealed bid process” (Carter et al., 2004). However, Amelinckx et al. (2008) and Pawar et al. (2017) state several other successful outcomes of conducting eRAs which exceeds the early eRA success definition by Carter et al. (2004), as seen in Figure 3.14. In other words, the use of eRAs as a negotiation tool can have different successful outcomes depending on how the eRA event is configured (Amelinckx et al., 2008; Pawar et al., 2017). It is thus necessary to identify which the eRA configuration elements are as well as how they correspond to successful eRA outcomes. Figure 3.14 further shows a set of *influencing factors and conditions*, as summarised from Amelinckx et al. (2008) and Pawar et al. (2017), which are what is argued to lead towards different successful eRA outcomes.

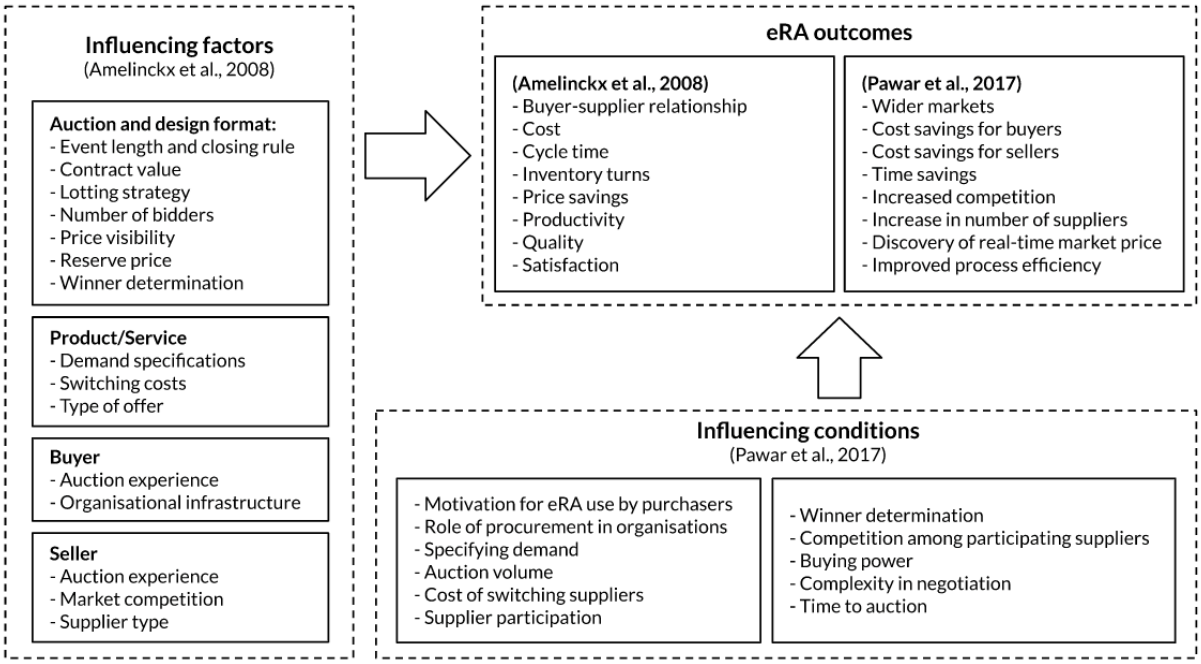

Figure 3.14. Influencing factors/conditions leading to different successful eRA outcomes. (based on Amelinckx et al. (2008) and Pawar et al. (2017))

Wagner & Schwab (2004) did similar research when they proposed a framework for successful eRAs by identifying eight variables of success and then tested these against 23 eRA events and the success of these, success being defined as a cost reduction of at least 5%. The framework, displayed in Figure 3.15, is presented as an octagon where a practitioner would fill in the estimated eight parameter values of the product and a larger area would indicate that the eRA have higher chances of being successful.

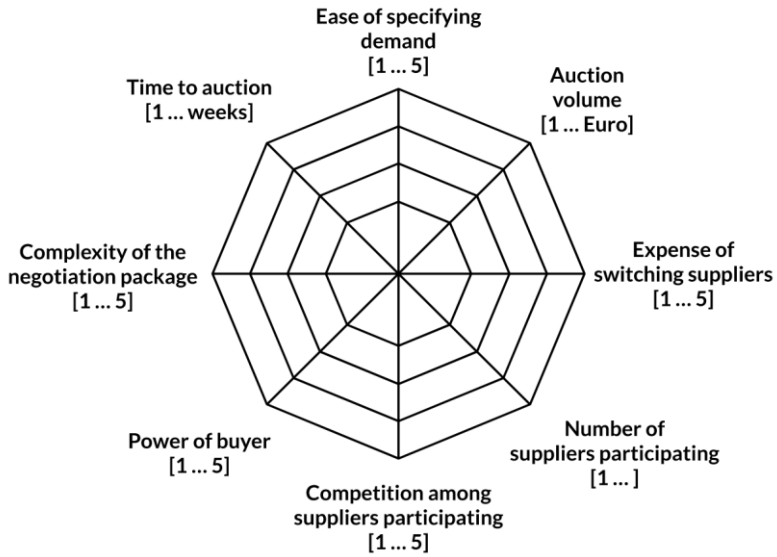

Figure 3.15. Framework for evaluating eRA chance of success. (based on Wagner & Schwab, 2004)

The summarised influencing factors and conditions have in turn been coded into various *configuration elements*, all of which have an emphasis on how the eRA event and its corresponding processes can be configured to achieve desired outcome. Theoretic coverage of each configuration element is summarised in Table 3.5 and explained in more detail in the sections below.

Table 3.5. Configuration elements of an eRA critical to eRA success.

Managing eRA design parameters	eRA event preparations	eRA governance structure
- Auction type - Bid disclosure policies - Main award criterias - Winner determination - Level of buyer commitment - eRA mechanism (true price discovery vs. contract allocation) - Event length and closing rules - Pre- and post-auction process balance	- Supply market and category analysis - Specifying demand to ensure comparability - Pre-qualification of eRA participants - Internal stakeholder preparations and training - External stakeholder preparations and training - Communication of eRA design parameters and rules	- Maintaining and communicating ethical guidelines - Supplier screening and qualification policies - Coverage of TCO evaluation
eRA integration	**Improving supplier bid engagement**	**Supplier relationship management**
- eRA system integration - eRA process integration	- Supply market competitiveness - Contract volumes and values - Bundling and lotting strategies - Supplier's bid visibility - Number of auction participants	- Fitness analysis in regards to existing supplier relationships - Managing current supplier base and existing relationships - Complying with communicated buyer commitments - Ensuring auction process recurrence

3.3.2 Managing eRA design parameters

In Table 6 the configuration elements linked to eRA design and format are summarised, all of which are described in more detail below.

Table 3.6. Configuration elements linked to management of eRA design parameters

	Auction type	eRA mechanism	Level of buyer commitment	Closing rules	Main award criteria	Winner determination	Bid disclosure	eRA process balance
Emiliani, 2000			X			X	X	X
Beall et al., 2003	X		X	X	X	X	X	
Carter et al., 2004					X		X	
Elmaghraby, 2007	X	X			X			
Jap, 2007			X	X			X	
Carter & Kaufmann, 2007			X					
Steinberg, 2012	X							

Beall et al. (2003) summarised a set of eRA design parameters under the terminology *auction format* which included the following elements: the level of bid disclosure, closing rules, participation rules and lastly the award rules. All of these can be altered in different combinations by switching up which auction type is used. Several kinds of auction types are being used in practice. Choosing between different auction types is a good way of optimising the auction marketplace in the hunt for successful eRA outcomes. Based on research by Beall et al. (2003) and Elmaghraby (2007), eRA design variations between different auction types are typically related to:

- how the price is incrementally changed
- what kind of information is disclosed with participating bidders during the auction
- How the auction ends (i.e. the *closing rule* or *closing strategy*)

Price increments can be changed in a predetermined way by the buyer. An example of this is within the so-called Japanese reverse auction, where an initial price is displayed (slightly higher than participating suppliers initially indicated price levels). The buyer will then successively drop the price until all suppliers which are not competitive enough have dropped out and there is only one participating supplier left who wins the business. The price can also be incrementally changed in real-time depending solely on the supplier's incoming bids, which is often called English reverse auction (Steinberg, 2012*)*. Beall et al. (2003) argue that predetermined incremental changes are good as it keeps suppliers active and prevents surprising last minute bids. Within the commonly defined reverse auction types, variations also exist depending on the level of bid disclosure, e.g. if the buyer allows full bid disclosure or if only the current standing among auction participants are shown which is often called rank disclosure or traffic light feedback (Beall et al., 2003; Jap, 2007). Jap (2007) suggested that full price visibility

results in more supplier skepticism and suspicions regarding buyer opportunism by both current and new suppliers, compared to auctions with sealed or ranked bid disclosure. Similarly, Carter et al. (2004) stated that eRAs with rank disclosure tend to be more successful than full bid disclosure.

Beall et al. (2003) argued that an important part of the eRA design is establishing the *closing strategy* and communicating it to the participating suppliers. Closing strategies, which state in which manner the auction will end, is divided into either a soft or a hard closing strategy. A soft close means that the time at which the auction is set to end can be extended if there is still competitive activity in place within the auction, whereas there are no such time extensions in a hard close (Beall et al., 2003). Millet et al. (2004) elaborated on that bidding participation was higher for auctions with durations of up to 5.5 hours, whereas auctions held in morning also had improved bidding participation. Meanwhile, Jap (2007) stated that industrial eRAs are typically carried out with soft closing rules and therefore means that the more interesting discussions regarding eRA format revolves around bid disclosure and rules regarding winner determination.

No matter what, different eRA formats inherently possess different dynamic influence between the participating suppliers, depending on where an initial auction price is set and how that price incrementally changes as well as what award criterias are communicated prior to the auction (Beall et al., 2003; Carter et al., 2004; Arnold et al., 2005). IBX Group (2009) pointed out that the outcome of an auction is dependent on how the award criterias for contract allocation are communicated. They distinguish between two common occurrences for eRA events: *price compression* versus *price reduction* (see Figure 3.16). Price compression is described as when auction bids tend to move towards the lowest price from an initial RFQ, which typically happens when price is not communicated as the main award criteria but rather one factor among other more intangible criterias. Price reduction is described as when auction bids beat the lowest price from an initial RFQ. The latter tend to be more likely to occur when price is communicated as the main award criteria in single-supplier award scenarios (IBX Group, 2009). Thus eRAs can be highly beneficial even in complex sourcing situations where intangible contract elements are of greater importance than price, as a way of increasing the available options among qualified yet price competitive suppliers.

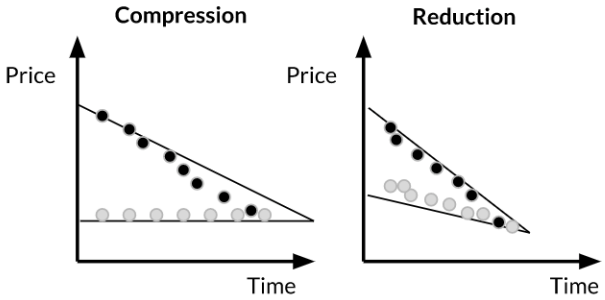

Figure 3.16. Possible eRA outcome: price compression vs. price reduction (based on IBX Group, 2009)

It is also important that the sourcing professional contemplates what the overall goal of the eRA is. An eRA can exert its role in the bigger eSourcing process as gaining intelligence regarding supplier's costs and the auction then serves as merely a price discovering mechanism (Elmaghraby, 2007; Carter et al., 2004). Then a comprehensive assessment of the eSourcing process in its entirety, i.e. from pre-auction exchange of information to the governance of the auction itself and finally to the post-auction negotiations, usually serves as the contract allocation mechanism. Another way to look at auctions is that it serves as the final allocation mechanism, when all negotiations regarding how the supplier is to deliver upon the specifications have instead been handled pre-auction (Elmaghraby, 2007). The latter use of eRAs naturally requires more preparatory work, as every element of the sourcing process has to be resolved prior to the auction event. Beall et al. (2003) pinpointed that many eSourcing

platforms already then were sophisticated enough to offer the possibility of clearing out such preparatory requirements. Simplifying the preparatory requirements of eRAs was argued to mainly be done through structured cross-functional sourcing processes inside the platform and/or conducting multiple round eRFx events with the participating supplier base (Beall et al., 2003).

A correctly executed auction process, according to research by Elmaghraby (2007), should be well balanced between pre- and post-auction activities. Establishing such pre- and post-auction process balance is an important step which needs to be carefully assessed depending on the characteristics of the goods to be sourced. When comparing how Emiliani (2000) and Elmaghraby (2007) both introduced what an eRA process looks like (see Figure 3.17), three interesting differences can be seen in regards to their pre/post auction process balance:

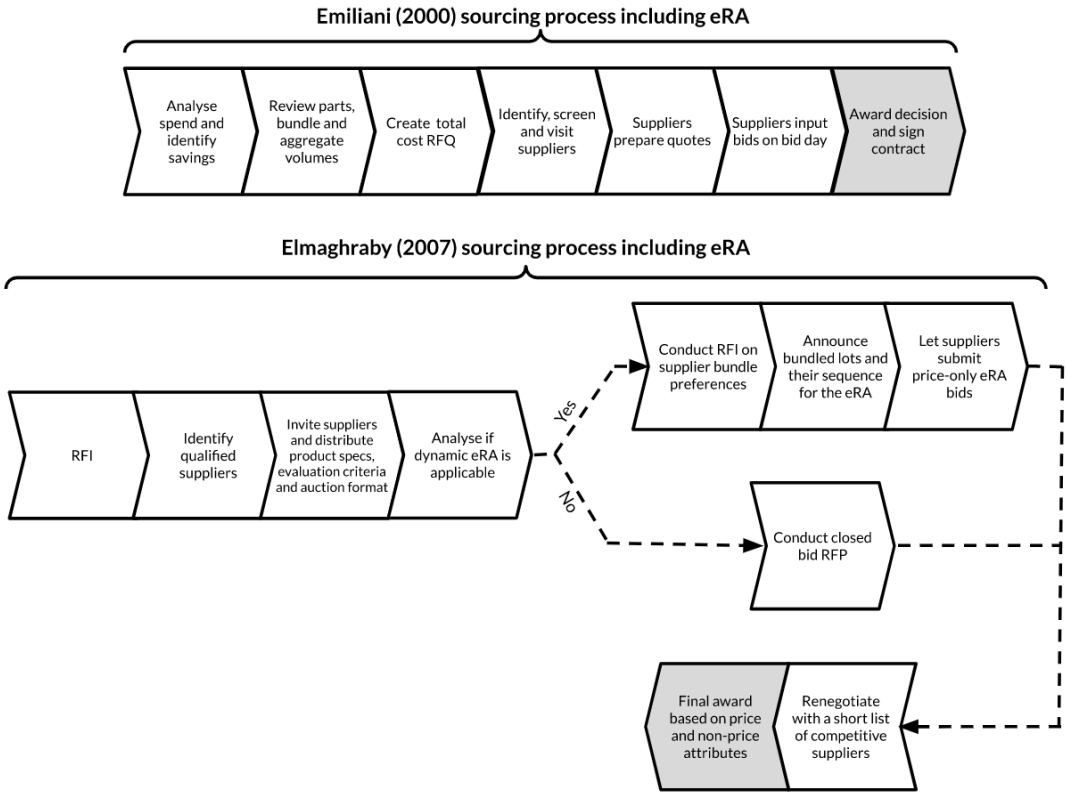

Figure 3.17. Comparison of eRA process structures and pre- and post auction activities. (adapted from Emiliani, 2000; Elmaghraby, 2007)

- *When and how the applicability of eRA is identified:* Emiliani (2000) argued that spend and category specific attributes will introduce opportunities to realise savings from conducting eRA, which in turn is based on spend analysis. Furthermore this is done prior to initiating any form of bidding procedure. On the other hand, Elmaghraby (2007) pinpointed the choice of conducting dynamic eRAs much later in the sourcing process and keeps the choice open of conducting a non-disclosed combinatorial bid RFP based on more non-price award attributes. The latter was proposed when the sourced goods or services are too complex for a price-only eRA.

- *Pre- and post-auction activities:* Emiliani (2000) stated that total cost RFQ should be done prior to the auction and at least in the proposed process structure follows up the auction event with an immediate awarding decision and contract signing based on suppliers performance in the eRA. However, Emiliani (2000) further elaborates on that there is necessarily no obligation for the buyer to accept any bid since there are often many other factors than price which may affect the award decision. Elmaghraby (2007) stated that multiple RFI can be conducted to figure out supplier capabilities and later

keeps the option open of re-negotiating with a few suppliers selected based on their performance in the eRA. The point is that the level of detail in an RFx has to account for more non-price attributes of the auctioned contract when entering the eRA with buyer commitment, so that supplier comparability has been achieved prior to conducting the auction.

- *How supplier inputs are included in the bundling strategy:* Emiliani (2000) suggested that volumes should be bundled and aggregated prior to the RFx, whereas Elmaghraby (2007) instead advocated for the inclusion of supplier specialist inputs into the bundling strategy much later in the sourcing process. In the closed bid RFP, suppliers instead propose the bundles and corresponding prices simultaneously.

In regards to winner determination, Jap (2007) distinguished between auction-determined and buyer-determined award rules. Buyer-determined award rules means that the buyer retains full latitude to to select the winner, independent of the eRA outcome. Auction-determined award rules instead means that the winner to some extent must be awarded based on the best contenders from the eRA. Jap (2007) argued that the buyer should maintain buyer-determined award rules when more intangible aspects of the product such as e.g. item quality and supplier reliability are of great importance and needs to be analysed and compared throughout the entire sourcing cycle. These situations also often necessitates further post-auction negotiation. Auction-determined award rules are instead suitable for situations when the products or services to be sourced are more easily and fairly compared and thus when the primary driver of sourcing decision ought to be price. Jap (2007) further implied that higher stakes, e.g. due to increased contract value, tends to improve buyer's commitment to the auction. Carter & Kaufmann (2007) in turn stated that relationship trust from suppliers and their willingness to participate in eRAs is positively impacted by higher levels of commitment to the eRA outcome from the buying organisation. As an addition to the discussion on the benefits of buyer commitment to eRA outcome, research by Carter et al. (2004) however stated that eRAs was rarely the last step in determining a winner as post-auction negotiations are often deployed anyway.

Regarding what award criteria the eRA should be based upon, price is almost always highlighted as the variable in the auctioned. Multiattribute auctions has been studied in literature, but is seldom used in practice (Elmaghraby, 2007). To put price being the main award criteria of eRAs into a bigger perspective, several downsides of conducting eRAs is highlighted in literature. These are typically the increased price fixation and the setting aside of TCO evaluations and collaboration based supplier relationships for the shorter term benefits of transaction based relationships (Beall et al., 2003; Carter et al., 2004; Emiliani & Stec, 2002). However, research has shown that there are many ways to figure out non-price attributes along the way well enough to achieve supplier comparability prior to conducting an eRA (Beall et al., 2003; Elmaghraby, 2007).

3.3.3 eRA event preparations

For an eRA event to be successful, literature points to certain preparatory steps required before conducting the event. The configuration elements and the authors mentioning these have been summarised into Table 3.7.

Table 3.7. Configuration elements linked to auction process preparations

	Supply market and category analysis	Pre-qualification of eRA participants	Specifying demand to ensure comparability	Internal stakeholder preparations and training	External stakeholder preparations and training	Communication of eRA design parameters and rules
Emiliani, 2000	X		X			
Beall et al., 2003	X	X	X	X	X	X
Carter et al., 2004			X	X	X	
Arnold et al., 2005	X	X	X		X	X
Elmaghraby, 2007	X	X	X			X
Pawar et al., 2017	X		X			
Smeltzer & Carr, 2003	X		X			
Amelinckx et al., 2008			X		X	
Wagner & Schwab, 2004	X	X	X			

There seems to be a consensus in research that all sourcing processes start with analysing the supply market and the category of the product to be procured, and the eRA sourcing approach is no exception. Some authors have proposed process maps for eRAs and the first step in these maps are always different types of analysis, for example Emiliani (2000) proposed “Analyse spend & identify savings” and Arnold et al. (2005) proposed “Strategic analysis” as the first step. In another process map an RFI-round is proposed to gather supply market data for analysis (Elmaghraby, 2007). An understanding of the supply market structure, degree of competitiveness, key cost drivers and current open capacity in the market is essential for the buyer to understand if an eRA is the appropriate sourcing approach and to set an appropriate reserve price in the auction (Smeltzer & Carr, 2003; Beall et al., 2003).

No articles were found that allowed unknown suppliers to bid in an auction. Before inviting suppliers they are pre-qualified as plausible future suppliers. In all articles discussing pre-qualifications it was done through sending out RFx’s to identified suppliers (Arnold et al., 2005; Beall et al., 2003; Elmaghraby, 2007). After receiving the RFx’s from the supplier base the acceptable suppliers are invited to pre-dialogues discussing the eRA and the product to be auctioned, if the supplier is still interested they are invited to the eRA event (Arnold et al., 2005; Elmaghraby, 2007).

There is consensus in that the product needs to be meticulously specified before the eRA event in order to enable comparability between bids. A very complex product does not preclude the success of an eRA if adequate specifications are provided (Beall et al., 2003). The main reason for this is to ensure that all participants correctly understand what they are bidding on and that all bids placed are made on equal terms (Pawar et al., 2017; Smeltzer & Carr, 2003).

Not all purchasers are used to or comfortable with using eRAs and therefore internal preparations are needed to overcome this barrier (Carter et al., 2004; Beall et al., 2003). The most common internal preparations are through training and education, but motivational stories of successful previous events are also used to help purchasers use the eRA sourcing approach more confidently (Carter et al., 2004; Beall et al., 2003). Before any successful eRA all external stakeholders, i.e. the bidding suppliers, should be given adequate training in the eSourcing platform on which the eRA event will be held. A test should be run to ensure that the technology is in place and that all participants understand how this specific auction operates (as there are multiple auction types available). Mock auctions are used to both give training and test the technology before the real event. (Beall et al., 2003).

3.3.4 eRA governance structure

The eRA success is to a large extent attributable to the governance of the process and the clear rules and conditions that all participants have to follow. Three configuration elements, displayed in Table 3.8, were found in literature.

Table 3.8. Configuration elements linked to governance structure of the eRA program.

	Ethical guidelines	Supplier screening qualification policies	Coverage of TCO evaluation
Emiliani, 2000		X	
Beall et al., 2003	X		X
Carter et al., 2004	X	X	
Arnold et al., 2005		X	X
Elmaghraby, 2007	X		X
Jap, 2007		X	
Pawar et al., 2017	X	X	X

While no explicit ethical guidelines were proposed, several researchers point out the risks regarding ethics in eRA events. Carter et al. (2004) interviewed buyers, suppliers and eSourcing service providers and allowed them to identify ethical issues in the perspective of a participant of an eRA. Twelve potential (un)ethical issues were identified that either the buyer, supplier or both could be subject to. Three issues were linked to the buyer as they could force suppliers into 'bankruptcy' by creating a too competitive market using the eRA, they could pretend to be suppliers in the eRA placing 'phantom bids' and they could invite 'unqualified suppliers' to the eRA that are not viable for allocating the contract and only there to push down prices. The suppliers could engage in 'collusion' to keep prices high or 'bid too low' with unrealistic prices hoping to get the contract and then paid appropriately afterwards. Suppliers could also potentially 'change specifications' after winning the contract and therefore recoup profits for the change in orders, or they could be sitting idle 'birdwatching' in the eRA event to gain market intelligence without any intentions to engage in the bidding. After the auction suppliers could place a 'new low bid' and be awarded the contract post-auction or the low prices have forced the supplier to cut corners putting 'safety' in risk for their employees. Both buyers and suppliers wished to avoid harming their 'reputation' and therefore act ethically, and one way this could be done is that both carefully 'explain' their intentions, communicate the eRA rules and sign an ethics statement. All twelve ethical issues are listed below (Carter et al., 2004):

- Buyer: Bankruptcy
- Buyer: Phantom bidding
- Buyer: Unqualified suppliers
- Supplier: Collusion
- Supplier: Bid too low
- Supplier: Change specifications
- Supplier: Birdwatching
- Supplier: Not deliverable
- Supplier: New low bid
- Supplier: Safety
- Both: Reputation
- Both: Explain intentions

Participation rules, as previously mentioned, is part of the auction format (Beall et al., 2003). The discussion on participation rules tends to result in policies regarding the required level of supplier pre-qualification. A consensus was understood that buyers should only allow viable suppliers to an eRA event, but a difference was seen if the final qualification of the suppliers could be done pre- or post-auction. In the process suggested by Emiliani (2000) all suppliers should be sent RFQs before the auction and the promising suppliers should be identified and qualified before the eRA event, but in the process suggested by Arnold (2005) all suppliers are selected and technical pre-dialogues are held before the auction but the final qualification of the supplier is not made until the bidding has been closed.

The eRA event is built around price bidding, but there exists other variables to the contract that the buying company needs to govern. An important facet of the eRA is the switching costs posed if a new supplier wins the contract, how should this cost be presented in the auction for the incumbent supplier to place adequate bids (Beall et al., 2003). Other differences between suppliers are most certainly probably to exist and an coverage of the TCO calculations should be made clear, technology exists for making multi-attribute eRAs and it is up to the governing party to set the rules of event in place to create a fair auction (Beall et al., 2003).

3.3.5 eRA integration

The eRA utilisation can be more or less integrated into already existing process and system structures. Both process and system integration, as well as the authors which discuss each configuration element, are summarised in Table 3.9.

Table 3.9. Configuration elements linked to eRA integration.

	eRA system integration	eRA process integration
Emiliani, 2000		X
Beall et al., 2003	X	X
Elmaghraby, 2007		X
Carter & Kaufmann, 2007		X
Amelinckx et al., 2008		X

In regards to the utilisation of eRAs and eSourcing in general, system integration and process integration are two interesting perspectives on the configuration of eRAs. Beall et al. (2003) early identified that eSourcing software and its access of eRAs is a technology which works well enough in a non-integrated stand-alone mode, meaning it does not require system integration into ERP or sourcing systems. Although a system integrated eSourcing implementation is arguably the optimal deployment due to data generation and master-data management, organisations which are immature in their system architecture and data management are still creating significant purchasing value from eSourcing software and eRAs (Beall et al., 2003). Beall et al. (2003) did however still list integrated ERP systems and the possibility to aggregate company-wide demand volumes as one of the main driving forces to start leveraging eRAs throughout a company's overall sourcing strategy.

In regards to sourcing process integration of eRAs, Beall et al. (2003) further stated that already at that stage many industrial companies were integrating eRAs into a more complex set of tools and approaches which facilitated their overall sourcing strategies. Combining the negotiation possibilities of eRAs with the specification and capability clarification effect of well executed eRFx events, is argued to unlock true effectiveness and efficiency throughout the purchasing process (Beall et al., 2003). The eRFx approach is also argued to also work well in combination with other negotiation approaches, such as sealed bid or traditional negotiations. Thus eRA success comes down to context specific knowledge of when eRAs will work better than other negotiation approaches, so that a routine choice can be made as means to complete the buying process with optimal outcome (Beall et al., 2003; Elmaghraby, 2007; Arnold et al., 2005; Carter & Kaufmann, 2007).

3.3.6 Supplier bid engagement

The eRA success is to a large extent attributable to how engaged participating suppliers are in the bidding process. Literature highlighted five configuration elements, displayed in Table 3.10.

Table 3.10. Configuration elements linked to achieving supplier bid engagement

	Contract volumes and values	Bundling and lotting strategies	Number of auction participants	Supply market competitiveness	Bid disclosure
Emiliani, 2000		X			
Beall et al., 2003	X		X	X	X
Carter et al., 2004	X	X	X	X	X
Wagner & Schwab, 2004	X		X	X	
Millet et al, 2004	X	X	X		
Elmaghraby, 2007	X	X			X
Jap, 2007	X	X			
Schoenherr & Mabert, 2008		X			
Schoenherr, 2019	X	X	X	X	X

Several researchers highlight the auction competition, i.e. the amount of suppliers engaged in the auction as an important determinant to eRA success (Carter et al., 2004; Wagner & Schwab, 2004; Millet et al., 2004; Schoenherr, 2019). Theoretically, an auction could be used when there are only two participating suppliers in an event (Beall et al., 2003). However, Carter et al., (2004) suggests that the eRA success is significantly improved if there are five or more suppliers participating. Similarly, Millet et al. (2004) empirically showed that the eRA success increased with the number of invited suppliers up to an optimum of six invited suppliers. Thereafter the eRA success declined modestly up until about 13 suppliers and was significantly less successful after 13 suppliers. Schoenherr (2019) challenged that level of needed participation by stating that eRAs can be successful with a minimum of 3 suppliers, although the lower extreme can arguably be sub-optimal. A specific optimal number of participants is most likely impossible to generalise. However one must be aware of the fact that after a certain point there will be relevant trade-offs between the attained level of competition within the eRA event and the required attention to supplier pre-qualifications. Furthermore, trying to optimise the eRA competitiveness by increasing supplier invitations introduces an ethical perspective by also looking at the need of supplier pre-qualifications (Beall et al., 2003; Carter et al., 2004; Arnold et al., 2005; Elmaghraby, 2007).

Wagner & Schwab (2004) lists both the number of participating suppliers and their relative competitiveness as important elements of eRA success. Participating supplier's bids are required to be independent of each other and they must possess the capability of delivering the product according to the specifications which is in line with discussions about the need for supplier pre-qualifications above. Whereas the number of participants is argued to influence competition in the eRA event, the relative competitiveness takes more of a supply market and industry perspective. If competition among suppliers within an industry is strong, suppliers are more willing to share information about cost structures and will have bigger incentives to cease all possible opportunities to increase their sales and might thus be more willing to provide competitive offers in eRAs. Situations of excess capacity or excess supply, as well as potential to realise economies of scale are further mentioned as supplier incentives to act competitively in an eRA event (Wagner & Schwab, 2004).

The level of bid disclosure which the supplier is subject to is further described as an element with which the buyer can increase competitiveness in the auction. The idea of manipulating the visibility of current bid is that the competition perceived by participating suppliers can be increased for example by only disclosing current auction rank (i.e. current standing based on supplier's last bid) or conducting closed-bid RFPs (Beall et al., 2007; Carter et al., 2004; Elmaghraby, 2007). Bid disclosure further increases the willingness from a supplier base to participate in the auction, which in turn increases supplier participation and the competitiveness in the event. This increased willingness usually derives from that both the problem of supplier's cost transparency and the supplier's skepticism towards buyer opportunism is removed if bids are not entirely disclosed (Carter et al., 2004; Jap, 2007).

In their analytical model of chances for a successful event, in Figure 3.15 above, Wagner & Schwab (2004) in summary elaborated thoroughly on the effects the element of auctioned contract volume and value has on eRA success. In general, higher auction volumes or value are more appealing for a supplier to bid on. That is because larger auction volumes for the supplier mean possibility to produce larger lot sizes. Larger lot sizes in turn are associated with lower transaction costs and economies of scale, and it thus becomes easier for the supplier base to justify the time required to prepare competitive bids. Volume and value further has positive effects from the buyer's perspective, mostly in preparatory activities when aggregative activities are initiated. Auction volumes and values can thus warrant the resource investments of conducting an eRA.

Based on similar reasoning, auction volume and value of the auctioned contract are often mentioned in literature when determining the strategic fit of an eRA tool and for maintaining

supplier engagement in the eRA event. Millet et al. (2004) found that suppliers were more prone to accept eRA invitations with an increased total value in the auctioned lot, whereas it decreased with fewer than 3 parallelly auctioned items. Arnold et al. (2005) further stated that both buyer's and supplier's administrative costs related to an eRA sourcing process become less palpable as the value in the auctioned lot increases. Specifically what minimum levels of spending are required to be addressed in each eRA event is however more scarce. An example from US public procurement however highlighted that eRA events had been made mandatory for all negotiations with budgets of more than $150.000 (Schoenherr, 2019, p. 90). In eRA research by Carter et al. (2004) the buying organisations from their case sample had run an average of $250 million through 104 auctions, implying that the average auction size was at least a million dollars.

Contract size and volumes can be aggregated through category bundling and lotting strategies, which in turn can stimulate supplier participation and competitive behaviour in the eRA event as the value at stake gets higher (Elmaghraby, 2007; Carter et al., 2004; Beall et al., 2003). Meanwhile, as the number of lots in an event increases there are also more varied opportunities in which the supplier can participate in bidding on the contract (Carter et al. 2004). Interorganisational relationships have thus been found to be positively impacted by an increasing number of lots addressed the eRA event (Jap, 2007). Emiliani (2000) discussed the importance of reviewing and aggregating parts from the viewpoint that it has both process benefits since less purchasing cycles has to be initiated, but also since it increases contract volumes and thus negotiation leverage is improved. Cross-functionality between the buying organisation's purchasing and manufacturing functions during bundling is argued to have positive effects on cost, delivery and quality performance. Bundling activities should in turn be based on either category features, or even better, the *process flow* (Emiliani, 2000). Elmaghraby (2007) further stated that it can be beneficial to include supplier's expertise and preferences regarding bundles, as it may ultimately prove optimal for quality and cost reasons. Jap (2007) stated that the auction lots tend to indicate how well of a match there is between supplier capabilities and buyer needs. Schoenherr & Mabert (2008) in turn summarised and analysed a set of hypotheses related to bundle performance in aggregation practices as well as their role as prerequisites of eRA success. They found that heightened item specification led to decreased bundle performance through lower supply base availability. This was argued to be because specification complexity tends to lead towards increased bundle complexity which in turn is what leads to lower supply base availability. Ultimately, supply base availability was argued to be what has positive effects on the bundle performance (Schoenherr & Mabert, 2008). Beall et al. (2003) even highlighted integrated ERP structures and the possibility of conducting company-wide demand aggregations as one of the initial driving forces which speeded up eRA and eSourcing implementation in the first place.

3.3.7 Supplier relationship management

Table 3.11 summarises four configuration elements which are linked to eRAs impact on supplier relationships.

Table 3.11. Configuration elements linked to supplier relationship management

	Fitness analysis: regarding existing supplier relationship	Managing current supplier base and existing relationships	Complying with communicated buyer commitments	Ensuring auction process recurrence
Emiliani, 2000		X		X
Beall et al., 2003	X	X	X	X
Elmaghraby, 2007		X		
Jap, 2007		X		
Smart & Harrison, 2003	X	X		X
Pawar et al., 2017		X		
Arnold et al., 2005	X			X
Carter et al., 2004		X		X

The first element for successful eRA events is that a fitness analysis should be performed to understand the dynamics of the current relationship with the incumbent supplier and how an eRA would change that. Arnold et al. (2005) describes this as performing an “Fitness analysis” of the product, as not all supplier relationships and sourcing fits an eRA approach. For some products it might be beneficial as it helps bring cross-functional focus to clear specifications and TCO, but sometimes the eRA would hinder other company departments' cooperation with a supplier.

Maintaining current supplier base and existing relationships are argued to have very positive effects on the efficiency in running a recurring eRA program (Carter et al., 2004). Managing both internal and external feedback dialogues are of great importance for the auction sustainability perspective of the buyer-supplier relationship. Important is that suppliers avoid perceiving the utilisation of eRA as negative (Arnold et al., 2005). Beall et al. (2003) mention leveraging the eRA processes with benefits for both companies that include cycle time reductions, decreased negotiation complexity and potential cash flow improvements. This could help the supplier relationship to be more efficient. Smart and Harrison (2004) points out that enormous cost reductions in “First strike auctions” will not be sustainable in the long term, in their study one auction reached a 37% cost reduction but explained it would be foolish to expect the same level of cost reduction next time when the contract goes out for tender. Emiliani (2000) highlighted several unresolved questions linked to the logics of attaining recurrence in an eRA program. The highlighted questions can be summarised to the following logical contradictions:

- Repetitive price reductions vs. suppliers expectations on favourable contract renewal positioning
- Contract and supplier development timelines vs. frequency in the cost reduction strategy
- The relative importance between long term buyer-supplier trust and collaboration vs. the need to reduce costs in order to remain a competitive alternative on the market

Understanding what relationship exists between the buyer and supplier could give insights to the eRA applicability. In Smart & Harrison (2003), they discovered a trend offered by eRAs that strategic partnerships with a few suppliers was changed into several new short-term partnerships instead, and that auctions were more fitting in that context. Beall et al. (2003) instead used the Kraljic matrix to pinpoint that eRA would fit all sourcing situations except strategic categories as it could potentially hurt strategic partnerships which is contrasting the more liberal view of Smart & Harrison (2003) using eRAs on strategic partnerships in order to break them up. IBX Group (2009) further declared that eRAs are most successful when used for sourcing situations in the leverage quadrant. In addition to maintaining good supplier relationships Beall et al. (2003) also it is not only important to communicate the level of buyer commitment but also complying to it, and if not this could hurt the relationships.

The last element of ensuring an auction process recurrence is described by Beall et al. (2003) as having award credibility. The buying company will get a reputation of how they comply with their communicated buyer commitment. Meaning that if the buyer holds their word in one auction the supplier will probably be happier to participate in the next. The award credibility is the trust of the suppliers in that the buyer will keep its promise of buyer commitment.

3.4 Summary of theoretic findings

To highlight the important theory and guide the reader into this study's research questions the summary is illustrated in Figure 3.18 and presented in the sections below.

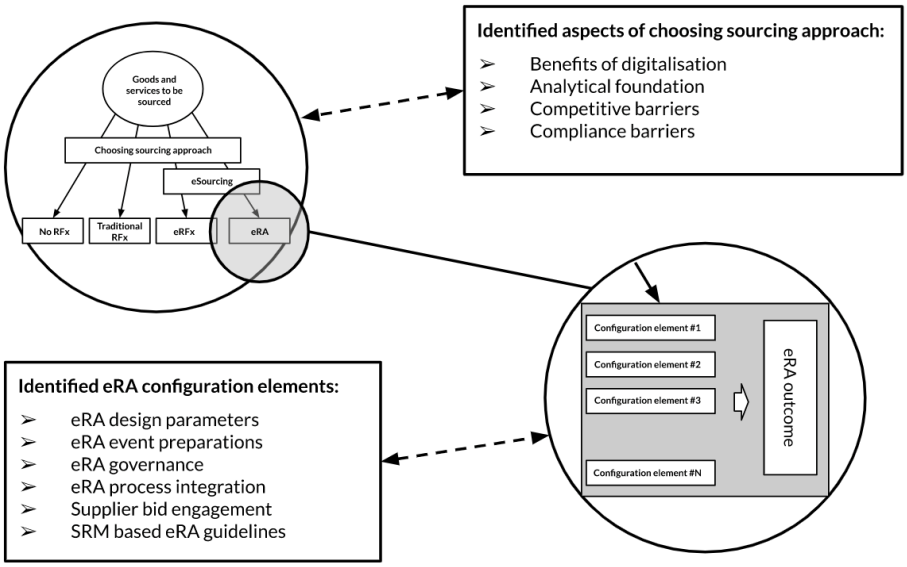

Figure 3.18. Theoretic summary of identified aspects and configuration elements.

3.4.1 Critical aspects of choosing sourcing approach

Four aspects which have impact when choosing sourcing approach were identified in the theoretic literature review, all of which are listed and described in essence below:

Benefits of sourcing digitalisation:
The organisational understanding of eSourcing related benefits is what fundamentally governs the logic of transitioning from the traditional F2F and email-based sourcing approaches into the eSourcing platform. Frequently mentioned benefits related to eSourcing technologies are savings and speed improvements, which are realised by decreased sourcing lead times and increasing the overall number and frequency of competitive sourcing events. The eSourcing platform further gives overview of the contact all buyers have with their respective supply markets, which in turn have an improving effect on supply risk management. Additional benefits are related to improved possibility for follow-up as well as quality and innovation management through better visibility, transparency and workflow overview inside the eSourcing platform. Some eSourcing platforms are also introducing new or improved cross-functional interfaces, especially when addressing eSourcing as the process improvement oriented source-to-contract form of sourcing digitalisation. Many of the mentioned benefits in turn pose the highly justified question whether or not all sourcing processes and RFx events should to some extent be conducted inside the platform rather than its traditional format. On a high level all eSourcing related benefits are linked either to an improved leverage of competitive supply market environments, or to the achievement of overall cross-functional process improvement within the sourcing domain. An organisation's understanding of eSourcing related benefits, as an aspect which governs the logic of transitioning towards eSourcing based approaches, thus also depends on which of these two underlying goals the company is striving for.

The analytical foundation:
The sourcing professional's insights regarding category characteristics, supply market characteristics and the existing supplier relationship context have an impact on how a sourcing strategy is defined in the sourcing project. Such insights are typically gathered from a set of analytical practices, including models and tools used to assess both the internal and external environment, which can be defined as the analytical foundation upon which decision-making is

based. Clearly defined category, supply market and supplier relationship structures and their individual characteristics are all important when substantiating the adequate choice of sourcing approach. Analysis of each structure might thus need its own analytical model or tool in order to achieve nuance in its definition and analysis. Important questions which need answering for any given sourcing project are: how complex the specifications are, what level of supply market competition exists and what strategic value is gained from the supplier relationship. To actually be able conduct the analysis is in turn enabled by managing a data infrastructure which gives each sourcing professional easy access to the necessary data. Such data infrastructure and corresponding analytical foundation is often described as a key enabler of utilising digitalised sourcing in a structured and thought-through way.

Barriers for conducting competitive supply market exercises:
The sourcing approaches which are introduced by eSourcing technology are eRFx and eRA. Both of which are competitive in nature and thus require certain supply market competition in order to be viable, with eRA putting more emphasis on a prerequisite level of required competition. Some level of supply market competition has obviously always been required even for the traditional email-based RFx event. The remainder of email-based RFx events is however questionable, as opposed to its digitalised format eRFx, due to a plethora of eSourcing related benefits. Thus the competitive approaches of eRFX and eRA are instead put in contrast with the non-competitive and SRM focused approach of direct negotiations. This contrast is fundamentally governed by barriers which by its nature inhibits the sourcing professional from conducting a competitive supply market exercise. Such competitive barriers can be e.g. supplier lock-in situations or complexity in fulfilling supplier approval/certification/patent requirements. It can also be the case that a mutually beneficial strategic partnership is in place and that a competitive supply market exercise would therefore be inappropriate. Specification complexity further has a tendency to raise difficulties in achieving comparability between suppliers, which in turn limits the possibility to create a competitive environment among the available supplier base. Competitive barriers (or reversely, opportunities to leverage supply market competition) are most often identified when analysing category and supplier structures on a sourcing project basis. This, once again, solidifies the importance of a well managed analytical foundation. Sourcing situations where many of these barriers are prominent will be reflected by the adequacy of direct negotiations is increased as compared to eRFX and eRA. Conversely, situations with highly competitive characteristics will be reflected by increased applicability of eRFx and eRA. The prerequisites of eRA in this regard are however considered greater than eRFx, mainly due to the compressed time in which an eRA event takes place.

Barriers for achieving organisational eSourcing compliance:
Although several benefits of utilising eSourcing technology are apparent, achieving organisational eSourcing compliance among all sourcing professionals remain difficult. The reluctance of adopting eSourcing practices are typically related to:

- *Implementation costs*
- *System capabilities*
- *Internal resistance*
- *Fear of reduced human interaction*
- *Security*
- *Supplier limitations*

Additional barriers of operational focus rather than strategic focus in the eSourcing implementation as well as a poorly defined sourcing process throughout the company, also supposedly slow down the eSourcing adoption.

3.4.2 Configuration elements critical to eRA success

Success in eRAs was in early eRA literature defined as “negotiation process outcome derived from use of eRAs which exceed the expected or perceived savings of a F2F negotiation or a traditional sealed bid process”. Contemporary literature covering the utilisation of eRAs however implies several possible outcomes including e.g. increased leverage of supply market competition, improved process efficiency, real-time market price discovery possibilities and reduced sourcing lead times. Thus, as eRA outcome will vary depending on how the eRA is configured, an eRA program as well as each individual eRA event should consequently be configured with clearly defined goals in mind. Initial coding of eRA literature from 2001-2019 resulted in identification of six broadly defined configuration elements. Figure 3.19 shows how each of these six configuration elements correspond to certain outcome goals desired from the eRA configuration. The two first configuration elements *eRA governance structure* and *eRA SRM based guidelines* are aimed at setting a value-based foundation for the entire eRA program including principles, policies and guidelines for when and how to utilise eRAs. Such a value-based foundation and its principles, policies and guidelines are often defined for the entire company-wide eRA utilisation in a non-flexible way. Meanwhile, the following three configuration elements *eRA design parameters*, *eRA event preparations* and *supplier bid engagement* are aimed at optimising the competitive settings of each eRA event. In other words, the three latter configuration elements are more flexible in nature and have to be assessed individually for each sourcing project. The sixth configuration element *eRA integration* finally aims at pinpointing how well the eRA utilisation is integrated with the overall sourcing practices and strategy, from a process as well as IT system perspective.

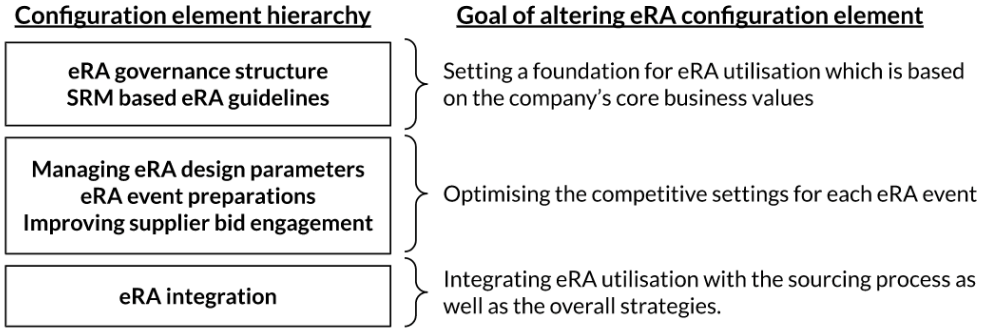

Figure 3.19. Identified eRA configuration elements and their corresponding goals.

4 Methodology

Methods are the guiding principles for the creation of knowledge and for them to be useful they must both fit the problem at hand and the ultimate presumptions held by the researchers. The criteria of quality for research will in turn depend on the ultimate presumptions and the method used, and to attain the quality desired it is important to create a consistency between them. This chapter will first clarify these topics and deduce the appropriate method, then it will describe the tools used for collecting data and it will conclude with detailing the analysis made to support our study.

4.1 Theory of science

In both research and business there exists different presumptions of what knowledge is, which is described as ontological and epistemological positioning. At the extremes viewpoints are either positivistic, there exists a universal truth, or relativistic, the truth depends on the context where it exists. This implies that readers with different perspectives on what knowledge is will interpret the results differently, but more importantly that the author must describe their viewpoint and use a method that is consistent with it to produce trustworthy results. (Arbnor & Bjerke, 2009)

4.1.1 Different scientific approaches

Arbnor & Bjerke (2009) propose three different methodological approaches: Analytical approach, systems approach and actors approach.

The analytical approach:
At the positivistic end of the spectrum the analytical approach is presented. In this approach an objective reality exists from which patterns and causal relations can construct the whole system. In Figure 4.1 this is presented as knowledge or judgement being factive and summative so that the pieces will equal the system. A researcher does not interact with the object of study in order to avoid influencing the object and distort the reality in which it exists, ergo other researchers would reach the exact same results in an analytical approach (Arbnor & Bjerke, 2009). Methods used in an analytical approach are often quantitative data analysis through statistical procedures (Gammelgaard, 2004).

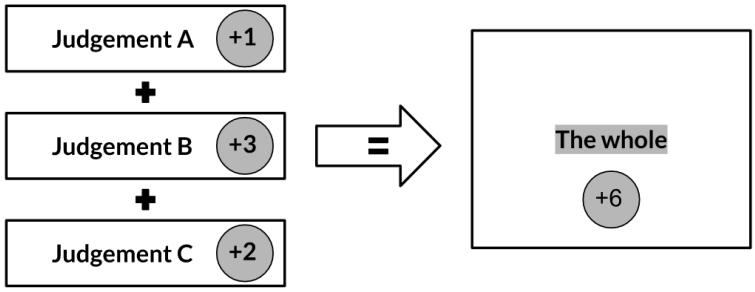

Figure 4.1. The analytical approach (based on Arbnor & Bjerke, 2009*).*

The systems approach:
The systems approach reflects on a view that is objective but the parts cannot be viewed separately as the relations between them are important and the whole will differ from the sum of its parts. The approach stems from attempting a holistic perspective on problems, especially in business. The knowledge developed is both objective and subjective, as the parts can be explained but only through the characteristics of the whole. As pictured in Figure 4.2 there will be a plus minus effect when combining the components of the systems into the whole (Arbnor & Bjerke, 2009). The ideal method in systems analysis is case studies, but quantitative methods as simulations or more qualitative methods as laboratory-like role playing are also used (Gammelgaard, 2004).

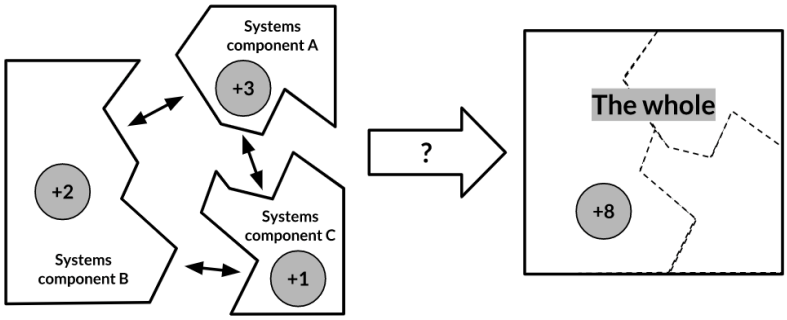

Figure 4.2. The systems approach (based on Arbnor & Bjerke, 2009*).*

The actors approach:
The actors approach lies in the relativistic spectrum, on the opposite extreme from the positivistic analytical approach. By participating in the system the actors view is interested in understanding the individual actors and the meaning of their actions in their surrounding context. These finite provinces of meaning from each actor creates an understanding of the whole. In Figure 4.3 the actors approach is depicted as the whole being socially constructed by knowledge as different meanings and their relationships (Arbnor & Bjerke, 2009). The methods used in actors' approach are qualitative studies, as investigations and interpretations of intentions, and are highly contextual (Gammelgaard, 2004).

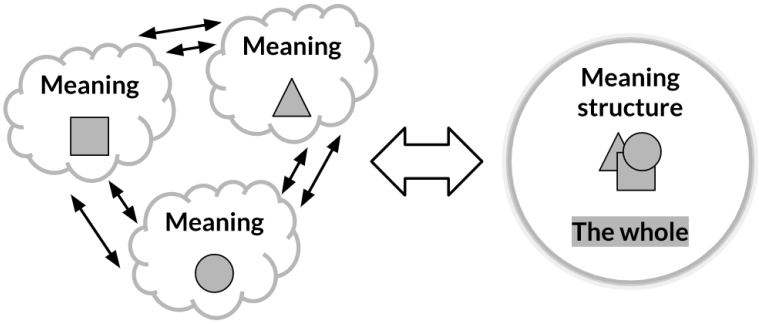

Figure 4.3. The actors approach (based on Arbnor & Bjerke, 2009).

4.1.2 Appropriate approach for this research

Exploring the application of the chosen eSourcing platform and how to configure eRAs efficiently will be very specifically contextualised by Trelleborg Group's internal processes. Meanwhile, eSourcing is widely adopted in the industry and plenty of ASPs and companies using the tools already exist. This research will therefore use both subjective knowledge in the context of Trelleborg Group, but also draw upon objective knowledge from generalising the insights of other companies' common experiences and learnings. By combining the two viewpoints, the appropriate approach for this research is concluded to be the systems approach. In Figure 4.4 the appropriate positioning is pictured.

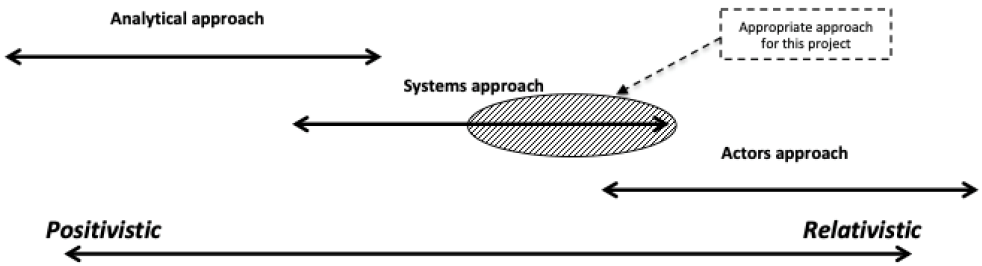

Figure 4.4. The appropriate approach for this project.

The purchasing functions which were investigated and analysed at Trelleborg Group as well as at each of the selected external cases can be seen as part of a larger system, i.e. the respective companies and their surroundings. When looking at such a big system, the synergies and influences between different parts of the system plays a big role and it is thus most often too complex to draw conclusions regarding relation between effect and causality. Hence, the report was limited to focus on the purchasing functions within each company as well as the choices made by these functions. In such a compressed system, choices and configurations made by the purchasing function can be influenced both by external aspects (e.g. company external or cross-functional influences) and internal aspects (e.g. barriers, strategy and goals of the purchasing function). Furthermore it is anticipated that a more compressed system will better represent the respondents perception of effects and their corresponding causes in various sourcing contexts. At the same time, maintaining an overview of external influences (or respondent's perceptions of these) is argued to keep the connection to the bigger system throughout the research.

4.2 Research method

Research quality is ultimately attained through thoughtfully pre-defined and consistently used research methods and techniques (Halldórsson & Aastrup, 2003; de Mota Pedrosa et al., 2012). Thus the following chapter will elaborate on structural research elements and how these have been assessed when developing the most suitable research method for this project.

4.2.1 Qualitative and quantitative methods

Methods can be divided into either qualitative or quantitative. Quantitative methods codify information and categorise it as numerical data or into classes, the data is then processed statistically to identify patterns that would either confirm or contradict a hypothesis. The results from a well conducted quantitative research should lead to conclusions transferable to a larger related population. The means of obtaining quantitative data are often surveys, time series analysis or experiments. (Patel & Davidsson, 2019, p. 51-57)

Qualitative methods collect data that is unable to be codified and quantified in a meaningful way. The aim is to gain a deeper understanding of one or a few research objects. By investigating the research object(s) in a repeated process, every cycle can discover new findings and generate greater knowledge. The qualitative studies are less structured than quantitative, starting open-minded and then narrowing it down in an organised codification using the findings and knowledge from each iteration. Trying to relate the patterns from the study to the chosen theory. The means of obtaining qualitative data are often interviews and observations. (Svenning, 2003, p. 159-160)

This thesis is primarily based on qualitative methods through case study design, because the study needed to be conducted in a specific context for the research insights to be addressable by the main project stakeholder Trelleborg Group's in their eSourcing implementation project. The information was mostly gathered through interviews and observations, and the insights from every interview or observation will further deepen the knowledge about the implementation project and used in following interactions with Trelleborg Group. All case studies had a qualitative focus due to its context seeking and explorative nature, but the insights were codified quantitatively and analysed as such in order to be transferable to the Trelleborg Group.

4.2.2 Inductive, deductive and abductive methods

There are different approaches of reasoning in research which can lead to new insights and conclusions. Three recognised methods are the deductive, inductive and abductive reasoning methods. Depending on the method chosen, it will clearly influence the view on theoretical and empirical findings and the relationship between them. (Kovács & Spens, 2005)

The deductive approach:
The deductive approach scans theory, derives logical conclusions from the theory and presents hypotheses and propositions. It further tests the hypotheses/propositions in an empirical environment and uses the results to disprove or validate them. The deductive process is schematically shown in Figure 4.5. (Kovács & Spens, 2005)

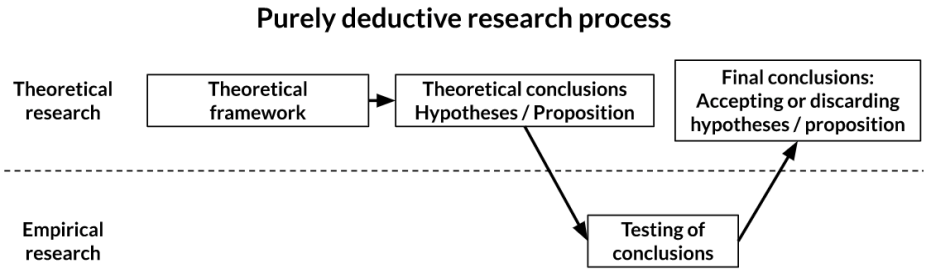

Figure 4.5. Deductive research process (based on Kovács & Spens, 2005).

The inductive approach:
The inductive approach follows another path, where the researcher only starts with their prior knowledge and then observes a phenomena. Using these observations a proposition is created and then generalised into a theoretical framework. A schematic map of the inductive research process is presented in Figure 4.6. (Kovács & Spens, 2005)

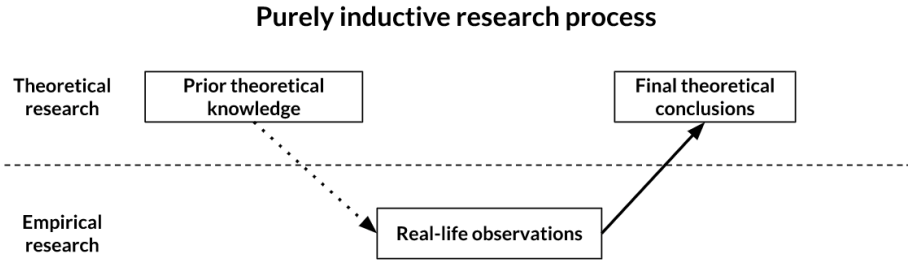

Figure 4.6. Inductive research process (based on Kovács & Spens, 2005).

The abductive approach:
The abductive approach shares similarities with both above-mentioned approaches, but it starts with observing a case (similar to inductive research) and by iteratively contextualising it with theory and more observations, a final conclusion or hypothesis/proposition can be reached. This hypothesis/proposition is then applied to the case in study (similar to deductive research) as depicted in Figure 4.7. (Kovács & Spens, 2005)

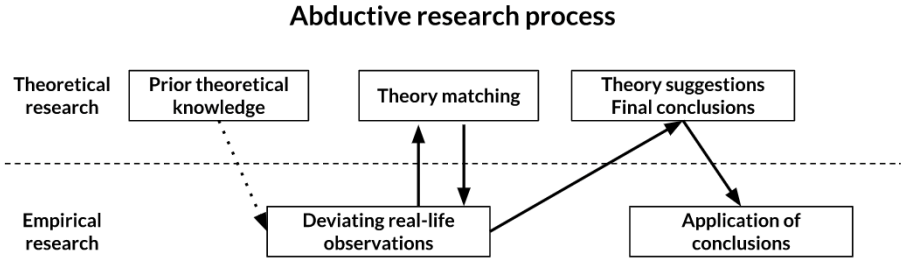

Figure 4.7. Abductive research process (based on Kovács & Spens, 2005).

This research will take an abductive approach as it starts with a case presented, i.e. the eSourcing initiative, that will be analysed. While examining the case, theory will be covered to understand the case and contextualise it forming a back and forth loop between interviews/observations (both internal and external) and literature review. The learnings from

both theory and observations from other cases will lead to final conclusions and those will then be applied to Trelleborg Group purchasing operations.

4.2.3 Research quality criteria

All research quality is evaluated, but the criterias of quality should depend on the research approach. This research will take a systems approach using a qualitative multiple-case study and the research method is built in regard with the quality criterias fitting to this context. Mainly two sources were used to evaluate the research method and design. Firstly Halldórsson & Aastrup (2003) as they defined quality criterias deemed relevant for qualitative research in logistics. Secondly de Mota Pedrosa et al. (2012) as they provided guidance in how to achieve quality in qualitative logistics case studies by highlighting similar quality criteria, but also how to operationalise such criteria into indicators and actions.

Halldórsson & Aastrup (2003) emphasise the need for rigor and relevance in qualitative research and presents "trustworthiness" as a concept of quality criteria. Trustworthiness according to them is composed of the four criterias of credibility, transferability, dependability and confirmability. A more granulated view of quality is similarly proposed by de Mota Pedrosa et al. (2012) in their paper as they present the three quality criterias transferability, truth-value, and traceability and then divide those into twelve sub-indicators. These quality criterias do not contradict Halldórsson & Aastrup (2003), but rather complement and expand the scope and suggest ways in which the researchers can operationalise the strive for quality in their research. Twelve indicators are proposed which are supposed to tell if the research is properly conducted or not. Either the indicator for quality is fulfilled, or it is not. Table 4.1 states all the quality criterias proposed and their respective indicators for quality. The indicators do not judge the quality per se, but acts as a checklist to tell if the researchers have gone through a thorough research process (de Mota Pedrosa et al., 2012).

*Table 4.1. Quality criterias and their indicators (*de Mota Pedrosa et al., 2012*).*

Transferability	***Truth-value***	***Traceability***
Theoretical aim of the study	Coding	Protocol or database
Unit of analysis	Comparison	Data collection guideline
Justification of case selection	Iteration	Informant selection
Number of cases used in study	Refutation	Number of informants

Transferability, as described by Halldórsson & Aastrup (2003), is the generalisation across populations, to which extent the study can make claims about the world. As all populations exist in a context the transferability refers to the ability to contextualise and describe similarities between the sending and receiving context (Halldórsson & Aastrup, 2003). The description as made by de Mota Pedrosa et al. (2012) suggests that the intent of achieving transferability is that the study's findings could be applied to other contexts than the specific study. The theoretical aim specifies the research and helps readers determine the applicability of the study into other contexts while the unit of analysis instead will define the level at which the phenomenon is studied and the boundaries to where it is not. Justification of case selection should be made in such a manner that each case either predicts a similar or contrasting result helping the readers to understand the study's applicability to other contexts. The number of cases used should be stated only to improve transferability (de Mota Pedrosa et al., 2012).

Dependability, as defined by Halldórsson & Aastrup (2003) derives from the conventional quest for invariance, how stable and reliable the data are. But the data is qualitative and changes are therefore expected, so dependability is built through sound documentation in the logic of process and method decisions (Halldórsson & Aastrup, 2003). Thus dependability as described by Halldórsson & Aastrup (2003) is linked to the definition of transferability suggested by de Mota Pedrosa et al., 2012), through both the justification of case selection as well as how the research project in its entirety has been designed. Furthermore, what case analysis methods will be used to draw upon new conclusions and extending theory is arguably the most important

decision in qualitative case research. Thus dependability as suggested by Halldórsson & Aastrup (2003) is also linked to the chosen case study analysis approach which are partially pinpointed in the indicators of truth-value by de Mota Pedrosa et al., 2012).

Credibility, as defined by Halldórsson & Aastrup (2003), is related to the degree upon which the study findings correspond to the reality. But as reality is contextual, credibility is the match between the constructed reality of the respondents and those represented by the evaluator. The stronger the match between the respondents constructed reality and the researchers representations of reality, the more credible the research is (Halldórsson & Aastrup, 2003). Truth-value, as defined by de Mota Pedrosa et al. (2012), correspondingly highlights the necessity of informants confirming the researchers' interpretation of their interviews and observations. The researcher's reality has to match the constructed one of the informants in their context for the truth to be valuable and look to a set of indicators of achieving truth-value. By *coding* the information into categories and abstracts the researchers can identify and present the data and analysis they find. *Comparisons* both identify the similarities and differences in the data as well as when analysing the properties between each category. *Iteration* is the activity when the researcher moves back and forth between data gathering and analysis. *Refutation* is the verification of the representativeness of the interpretations and conclusions together with the informants. If these analytic indicators are fulfilled they will show a systematic approach, and if well-documented it will reinforce the truth-value of the study (de Mota Pedrosa et al., 2012).

Halldórsson & Aastrup (2003) suggests that confirmability is the capability to demonstrate how the findings are confirmed by the data. How to efficiently track the conclusions, interpretations and recommendations of the research back to their data sources. Ensuring confirmability is met enables an external actor to assert the results of the study (Halldórsson & Aastrup, 2003). Similarly, de Mota Pedrosa et al. (2012) refers to traceability as the documentation of the research process and the data sources. Using sound data collection techniques will enable others to both repeat and confirm the study and its validity. By documenting the justification of how both cases and the informants were selected the readers are given an opportunity to assess the suitability of the case study. Furthermore, by describing the data collection protocol as well as guidelines for how they were developed, the readers can more easily reproduce the data for their own analysis (de Mota Pedrosa et al., 2012).

4.3 Research process design and project plan

Yin (2009, p. 25-60) states that decisions regarding case study design can be broken down by highlighting the following five components: the nature of the research questions; the expected data analysis; the propositions; the logic plan which links the data to the propositions; and finally the criteria for conducting analysis. Another very important part of the research design stage is to identify suitable theory that will be examined in the case study. This includes its rival hypothesis, as moving out of research conformity helps building a stronger case research plan and thus improves research quality (Yin, 2009, p. 40-45).

For this research the multiple-case design has been chosen, as it is a research design which is good for contextualising and drawing upon the understanding of factors that allowed for successful outcomes in one case but less successful in another (Yin, 2009, p. 53-56), just as needed for this research project. A larger multiple-case sample can give a greater opportunity of coding and categorising collected data in a cross-case analysis, thus increasing the chance of achieving trustworthiness, through the quality criterias *transferability* and *dependability* (Halldórsson & Aastrup, 2003). Sometimes in qualitative research there can be issues in attaining a good balance between depth of understanding and the breadth and variety of data collection (Boddy, 2016). Thus a sample size of six industrial manufacturing companies were chosen to participate in the multiple-case, as this was considered enough to produce in-depth but transferable extensions of eSourcing theory.

In regards to how to design the project plan, Yin (2009, p. 57) reintroduced his revered research project structure which is highly suitable when conducting case research. The proposed research project structure consists of six steps which are linear but iterative in nature, from planning and designing the project to finally concluding and sharing the insights. Linearly iterative means that e.g. restructuring and re-categorisation of early research insights might have to be done throughout later phases when necessary in order to move forward in the project with maintained attention to the mentioned quality criterias. By using the ideas and concepts of qualitative research quality from Halldórsson & Aastrup (2003) combined with the clear indicators from de Mota Pedrosa et al. (2012) when designing the research process the aim is to reach for higher quality in this study. The general interconnection between their suggested criterias and how each criteria correspond to the quality indicators introduced by de Mota Pedrosa et al. (2012) is illustrated in Figure 4.8.

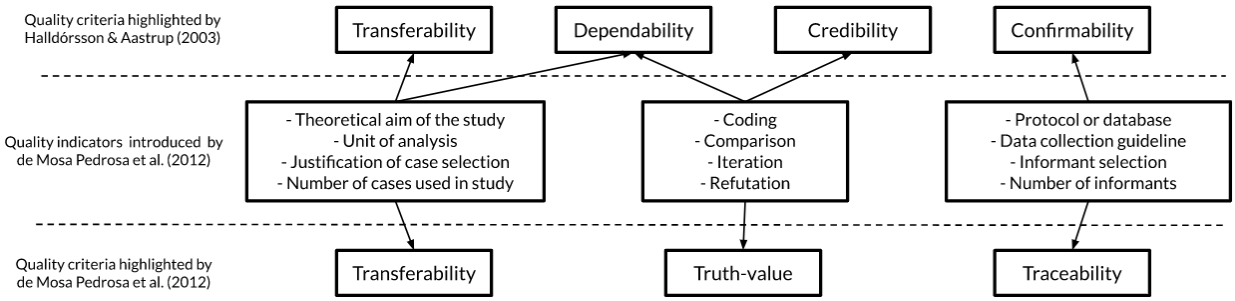

Figure 4.8. Connections between quality criterias and their corresponding indicators. (based on de Mota Pedrosa et al., 2012 and Halldórsson & Aastrup, 2003)

With such quality criteria and indicators in mind, a detailed research project plan was defined early in the project, see Figure 4.9. This plan was consistently followed throughout the project. In the project, the multiple-case research structure suggested by Yin (2009) was adapted slightly in its final steps to fit the goal and context of the main project stakeholder, Trelleborg Group's purchasing organisation, while still ensuring that the main research conclusions remain unbiased by their current situation. In short this meant that data collection and analysis of the internal Trelleborg Group case, in the form of spend analysis data and contextual organisation assessment in regards to their current eSourcing initiative, was kept isolated from the main external multiple-case analysis.

In the last concluding steps, implications were developed based on the specific context described in the internal case of Trelleborg Group. As it is hard (if not impossible) to isolate parallel thought-processes during contemporary analyses, the importance of maintaining a strict data collection protocol is well pinpointed and should thus be kept in mind throughout the process. This is of equal importance when analysing external cases individually prior to a cross-case analysis.

Despite that the internal case was kept isolated as much as possible, the research setup has highly abductive characteristics. Initial meetings with representatives of Trelleborg Group, the external multiple-case and internal case data collection along with both preparatory and adapting literature review gave room for iterative theory matching prior to concluding and presenting new suggestions for how to extend theory. This research setup was chosen in order to be able to contextualise the case observations with the help of theory and by early on introducing Trelleborg Group's curiosities and problems related to their current eSourcing initiative. The initial meetings with Trelleborg Group were further needed, prior to designing the research project, to get an idea of what they were wondering and what troubles they had in their recently conducted eSourcing pilot project. This way not only general conclusions and implications could be developed from iterative cross-case analysis through coding, comparing and refutation. But also making those conclusions addressable specifically to Trelleborg Group and their current eSourcing initiative. Furthermore, applying the general implications on

Trelleborg Group's specific purchasing context had a validating effect which improved research quality by confirming that our findings, developed with mentioned quality criteria in mind, are also adequate to Trelleborg Group's situation.

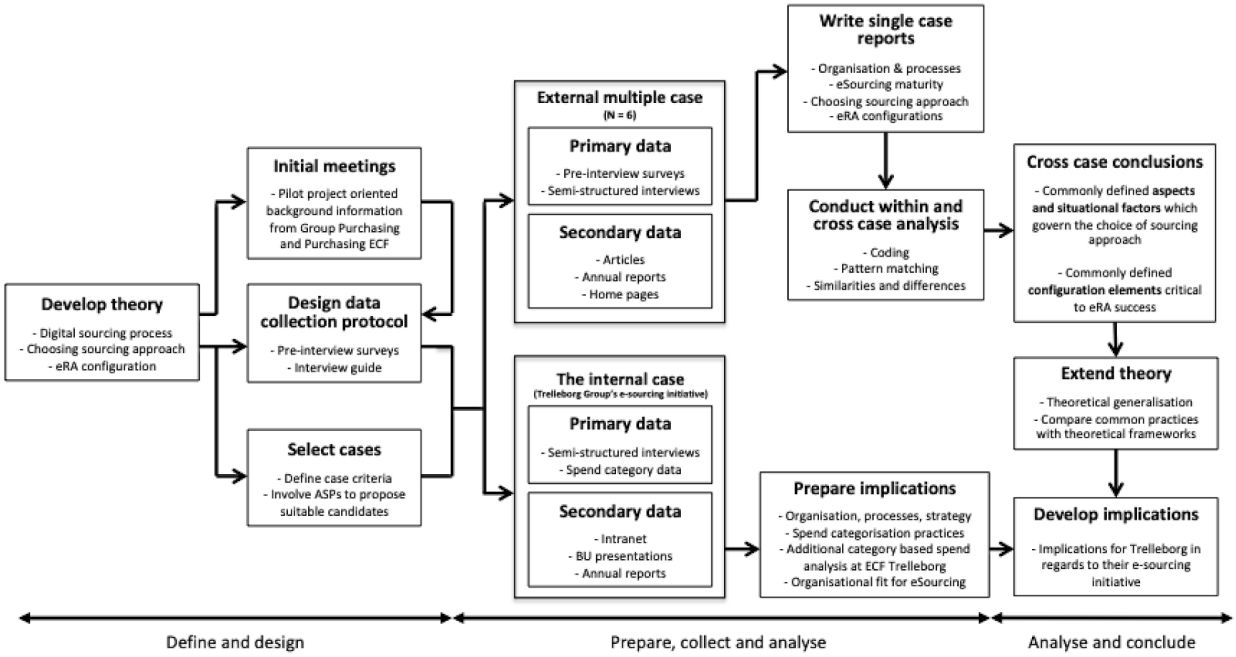

Figure 4.9. Research project plan

4.4 Case selection

To further develop the quality of the research this section will first define the selection criterias and the method of selecting cases. Then each selected external case and their respective informant(s), as well as the internal Trelleborg Group case environment, will be explained and justified for this study. The justifications made are done with the units of analysis in mind, which are described in chapter 1.4.

4.4.1 Criterias for external case selection

All external multiple-case samples were approved and chosen based on how they corresponded to a predefined set of case selection criterias. The pre-defined criteria were that case participants needed to

- be large manufacturing companies (>100M € in annual turnover)
- several production sites
- using an eSourcing platform in some of their sourcing processes
- have some form of experience of using eRAs

Furthermore, case participants needed to be represented in interviews by *at least one knowledgeable manager with strategic insight into the eSourcing programmes and strategic sourcing practices at their company*, i.e. preferably VP purchasing or equivalent. Case participants were also *preferably international* and to some extent *decentralised* in their organisational structure especially in regards to their purchasing organisation.

Based on these predefined set of criteria, a list of known potential cases were identified and segmented mainly from the Scandinavian manufacturing markets. A total of 23 companies were contacted per telephone and/or email, out of which 19 responded. Among all responding companies, 18 were positive to the research inquiry whereas only 7 qualified for the case and were thus invited to the multiple-case study. Due to one declined invitation, the final case sample ended up on a total of 6 participating companies.

4.4.2 Justification of selected external cases

The total case segmentation can be seen in Appendix A, whereas the selected cases are summarised and described shortly based on the case selection criteria in Table 4.2.

Table 4.2. Summary of multiple-case companies and their participants

Case	***Industry***	***Products***	***Annual sales (€)***	***Informant(s) job title(s)***	***eSourcing implemented***	***eSourcing solution***
Case Alpha	Manufacturing	Machinery components, e.g. bearings, seals, lubrication and lubrication systems	7,80 billion (2018)	Group Purchasing Strategy & Business Transformation Director	3+ years ago	SAP Ariba + Coupa
Case Beta	Manufacturing	Household and industrial vacuum cleaners	1,05 billion (2018)	eSourcing Transformation and Innovation Leader	1 year ago	SAP Ariba
Case Gamma	Manufacturing	On-road load handling solutions (cranes, forklifts)	1,36 billion (2018)	Sourcing director	3 years ago	Ivalua
Case Delta	Manufacturing	Entrance safety and lock systems	2,13 billion (2018)	Global sourcing director; Indirect sourcing manager	5 years ago	Scanmarket
Case Epsilon	Manufacturing, agriculture, food, energy	Various brands related to agriculture, energy, food etc.	4,40 billion (2018)	Head of Procurement; Implementation project leader	5 years ago	Scanmarket
Case Zeta	Construction	Road surfaces, construction and infrastructure projects	5,16 billion (2018)	CPO; Head of purchasing systems	10+ years ago	IBX + internally developed systems

Individual justifications for each case company selection and their corresponding informants are described in detail in Table 4.3.

Table 4.3. Individual justifications for each case company selection.

Case company	**Justification for case selection**
Alpha	Fulfilled all case selection criteria. Implemented eSourcing (SAP Ariba and Coupa) 3 years ago. Experience from both eRFx and eRA (but eRA program not fully implemented). All types of categories represented, including logistics and transport services. High strategic level of the case informant led to interesting discussions. Alpha further provided extensive information regarding how their global purchasing organisation was prepared for an extensive eSourcing rollout project by centralising big parts of the sourcing organisation. Case justified as relevant for both research questions.
Beta	Fulfilled all case selection criteria, even though being only 1 year into their eSourcing implementation. Except eRFx and eRA, Beta was using several eSourcing modules such as contract management, supplier lifecycle and performance management. The case informant had to a large extent been strategically involved in eSourcing implementation projects at previous employers. Case justified as relevant for both research questions. However, the case lacked detailed coverage regarding the company's category management practices.
Gamma	Fulfilled all case selection criteria, except that they had not yet utilised eRA. The company had a plan for how to use and configure their eRAs in the future. However, it was deemed that this plan could not yet be articulated in enough detail to be taken into account on the second research question regarding eRA configuration. Seeing as Gamma was 3-4 years into their eSourcing implementation and had a good structure of how sourcing approaches were chosen, they were still justified as highly relevant for analysis of what aspects to consider when choosing sourcing approach. The high strategic level and entire responsibility of the eSourcing program of the case informant further solidified Gamma's relevance for the first research question.
Delta	Fulfilled all case selection criteria. Delta was one of the most relevant case companies in the analysis of the second research question regarding eRA configuration, since they were conducting the most eRAs annually. Regarding the choice of sourcing approach, Delta stood out in regards to their level of eRA push into the organisation. Yet they still seemed to achieve balance among all utilised sourcing approaches. Delta was represented by two informants which had varying organisational strategic levels, however both very involved in their eSourcing program. Case justified as relevant for both research questions.
Epsilon	Epsilon was deemed to fulfill all case selection criteria, despite their diversified industry focus (outside only manufacturing). Epsilon was one of the most relevant case companies in the analysis of the second research question regarding eRA configuration, due to their extensive and strategic use of eRAs. The case company was represented by two informants which had varying organisational strategic levels. However both informants were very strategically involved with, as well as responsible for, the eSourcing program. Due to the informants detailed insights regarding the overall sourcing practices and all available sourcing approaches, it also greatly contributed to the aspects to consider when choosing sourcing approach. Case justified as relevant for both research questions.
Zeta	Fulfilled all case selection criteria, except that it is a construction company. That fact still led to important insights regarding how sourcing lead times and specification dynamics affect the choice of sourcing approach. Zeta was represented by two informants which had very varying organisational strategic levels as well as linkages to their eSourcing program. In regards to eSourcing implementation, Zeta had undergone several implementation thresholds over the 10+ years that they had been using eSourcing platforms. Although the company had transitioned towards eProcurement solutions in later years, the case informants could still contribute with their insights regarding both aspects of choosing sourcing approach, as well as how to configure successful eRA events. Case justified as relevant for both research questions.

In the case company sample only two companies, Delta and Epsilon, were fully operational with their eRA utilisation. Meanwhile two case companies, Alpha and Beta, were not yet fully operational but still brought valuable insights from their detailed plans of how to implement eRAs into their sourcing strategies. Zeta provided information about why they choose not to utilise eRAs, even though it was available in their eSourcing functionality. Lastly, Gamma was not providing sufficient information regarding the eRA utilisation and configuration, except that they were very early in implementation, and have thus been excluded from the second research question. How each company distributes over these classifications of eRA utilisation is shown in Table 4.4. As a consequence of the classifications, Delta and Epsilon are considered to provide evident and trustworthy insights regarding eRA configuration whereas the other companies provide more speculative, yet valuable, insights regarding their upcoming eRA configurations.

Table 4.4. Level of eRA utilisation.

Level of eRA utilisation	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Fully operational in eRA utilisation				x	x	
Ongoing eRA implementation	x	x				
Active choice to refrain from eRA						x
Insufficient case information			X			

4.4.3 Justification of internal case: ECF Trelleborg

The internal case was performed at the local manufacturing site in Trelleborg, which is part of the BU: Engineered Coated Fabrics (ECF). It was chosen on directive of Trelleborg Group's VP Purchasing. The underlying reasoning behind choosing this site was partly that it was the most available site for the project from a geographical and logistical point of view.

Furthermore, it was argued that the different sourcing roles on this site and their corresponding BU's had early shown signs of adoption to the eSourcing methods throughout the pilot project and were likely to be of sufficient help throughout the internal case study.

4.5 Data collection

This section elaborates on the design, method and protocols of how data was collected throughout the research project. Majority of primary data was collected from interviews, whereas the unit of observation being one to two interviewees per external case. Interviewees were identified as knowledgeable practitioners with particular insight to the strategic sourcing and eSourcing programmes at their company.

4.5.1 Trelleborg Group's internal data

The internal supplier and spend data from Trelleborg Group was shared by purchasing and supply chain representatives from ECF Trelleborg and Trelleborg Group Purchasing from their respective ERP systems and data infrastructures. Additional data related insights were clarified in internal meetings. When conducting the internal analysis at Trelleborg Group, a lot of sensitive strategic data was come across. Examples of such data were the entire supplier bases and their corresponding part of the purchasing spend for both of the two sites.

The internal spend category analysis was used to validate the multiple-case research findings regarding when and how Trelleborg Group could apply eSourcing and how they should configure their eRAs. Analysing the site specific data and validating the findings from the multiple-case on it was a substantial part of the project.

Although the conducted spend analysis were not necessarily generalisable to the rest of Trelleborg Group's strategic sourcing practices, some parts of the internal analysis had to

remain secretive in order not to reveal their strategic company advantages. In order to still maintain the validating effects of running a parallel internal case, tight discussions with Trelleborg Group's management was held to make sure the larger picture of the project could be shared in order to ensure that the credibility of the thesis would not suffer.

4.5.2 Literature review

Extensive literature review was important for this project by contextualising digitalised purchasing and sourcing processes, practices of category and purchasing portfolio management, and what drives success in eRA strategy. During the theoretic literature review provisional coding (Miles, Huberman & Saldaña, 2014, p. 77-78) were used as a preparatory investigation of the research area. It was used to raise the quality of the data collection protocols in the case studies and ensured it was detailed and sequenced in a way that cross-case analysis could be conducted.

Especially eRAs was extensively researched in an initial literature review due to the fact that Trelleborg Group had emphasised particular interest regarding the concept. Additionally, eRA called for more rigorous theoretical categorisation of anticipated critical configuration elements due to the more complex nature of an eRA event compared to other more conventional sourcing approaches.

The frame of references for the conducted literature review is shown in Table 4.5, including the searched keywords, authors and research focus.

Table 4.5. Frame of references.

Keyword(s)	Author(s), year of publish	Publication title	Journal/Publisher
industrial purchasing, electronic sourcing, electronic procurement, digital sourcing, source-to-contract, purchasing process, sourcing process	Schoenherr (2019)	The evolution of electronic procurement	Palgrave Pivot
	Bäckstrand et al. (2019)	Purchasing process models: Inspiration for teaching purchasing and supply management.	Journal of Purchasing and Supply Management
	Rajala (2019)	What is "Spot Purchasing?" And How Can it be Compliant?	Basware.com
	Schnellbächer et al. (2018)	Jump-Starting the Digital Procurement Journey	Boston Consulting Group
	Högel et al. (2018)	Delivering on Digital Procurement's Promise	Boston Consulting Group
	Jain & Woodcock (2017)	A road map for digitizing source-to-pay.	McKinsey & Co
	Ericson & Brandyberry (2010)	Jumpstarting Your eSourcing Initiative.	AT Kearney
	Teo et al. (2009)	Adopters and non-adopters of e-procurement in Singapore: An empirical study.	Omega
	IBX Group (2009)	Electronic purchasing: eSourcing and eProcurement	IBX Group
	van Donk et al. (2008)	Communication media selection in buyer-supplier relationships.	International Journal of Operations & Production Management
	van Weele (2002, 2014)	Purchasing and Supply Chain Management	Thomson Learning
	Neef, D. (2001)	E-Procurement: From strategy to implementation	Prentice-Hall PTR
category management, strategic sourcing, spend analysis, purchasing portfolio management, supplier relationship management	O'Brien (2019)	Category management in purchasing: a strategic approach to maximize business profitability.	Kogan Page Publishers.
	Schuh et al. (2014)	Supplier Relationship Management.	Apress Publisher
	Cox et al. (2005)	Sourcing Indirect Spend: Survey of Current Strategies for Non-Revenue-Generating Goods and Services	Journal of Supply Chain Management
	Rendon (2005)	Commodity sourcing strategies: Processes, best practices, and defense initiatives.	Journal of Contract Management
	Gelderman & van Weele (2003)	Handling measurement issues and strategic directions in Kraljic's purchasing portfolio model	Journal of Supply Chain Management
	Bensaou, M. (1999)	Portfolios of buyer-supplier relationships	MIT Sloan Management Review
	Kraljic (1983)	Purchasing must become supply management	Harvard Business Review
Electronic reverse auctions, online reverse auctions	Schoenherr (2019)	The evolution of electronic procurement	Palgrave Pivot
	Pawar et al. (2017)	Systematic literature review on electronic reverse auction: issues and research discussion.	International Journal of Procurement Management
	Steinberg (2012)	Auction pricing.	Oxford Handbook of Pricing Management
	Amelinckx et al. (2008)	Extending electronic sourcing theory: An exploratory study of electronic reverse auction outcomes.	Electronic Commerce Research and Applications
	Schoenherr & Mabert, 2008	The use of bundling in B2B online reverse auctions.	Journal of Operations Management
	Elmaghraby (2007)	Auctions within e-sourcing events	Production and Operations Management
	Jap (2007)	The impact of online reverse auction design on buyer–supplier relationships	Journal of Marketing
	Carter & Kaufmann (2007)	The impact of electronic reverse auctions on supplier performance: the mediating role of relationship variables	Journal of Supply Chain Management
	Arnold et al. (2005)	Target-oriented use of strategic sourcing tools: A critical analysis creating process awareness for electronic reverse auctions	Journal of Purchasing and Supply Management
	Wagner & Schwab (2004)	Setting the stage for successful electronic reverse auctions.	Journal of Purchasing and Supply Management
	Millet et al. (2004)	Metrics for managing online procurement auctions	Interfaces
	Carter et al. (2004)	Reverse auctions—grounded theory from the buyer and supplier perspective	Transportation Research, Part E
	Beall et al. (2003)	The role of reverse auctions in strategic sourcing	CAPSresearch
	Smeltzer & Carr (2003)	Electronic reverse auctions: Promises, risks and conditions for success.	Industrial Marketing Management
	Smart & Harrison (2003)	Online reverse auctions and their role in buyer-supplier relationships	Journal of Purchasing and Supply Management
	Emiliani & Stec (2002)	Realizing savings from online reverse auctions.	Supply Chain Management: An International Journal
	Emiliani (2000)	Business-to-business online auctions: key issues for purchasing process improvement	Supply Chain Management: An International Journal

4.5.3 Semi-structured interview framework

The main primary data sets of the multiple-case was collected using semi-structured interviews within a multiple-case study approach. This research project required exploration of the opinions and perceptions of relevant company representatives with strategic knowledge of efficient purchasing practices in complex and faceted contexts. Specific interest was with their insights regarding the aspects and situational factors which had influenced their use of either direct negotiations, RFx, eRFx or eRA as well as what elements were typically configured to achieve successful eRAs. Extracting such knowledge would be difficult to achieve without being able to steer the conversation through a structured interview protocol.

Although the interviews were semi-structured following the interview guide in Appendix B, rigorous attention was put to the specificity of the interview questioning. Such rigorous attention included the *specific wording* and *sequencing* of interview questions in the interview guides as highlighted by Barriball & While (1994), due to the interview's importance as primary data collection protocol for this research. In regards to addressing the tacit assumptions among respondents, most commonly adopted wording was used which was mostly deducted from the initial literature review through provisional coding (Miles et al., 2005). Before all interviews the interview guide was sent out to the interviewees for them to build a context of the research conducted and prepare with necessary data needed.

For the internal case, several internal meetings were the primary source of internal data collection. These meetings were held with strategic, tactical and operative purchasing representatives of the BU site ECF Trelleborg and the business area TIS. These meetings were generally non-documented and combined with email contact which had the purpose of setting up the structure and context of the project as well as framing the scope of the internal analysis. The internal data collection did not have the same focus on maintaining a structured data collection protocol as in the external multiple-case interviews, since the project was conducted from the Trelleborg Group headquarters in Trelleborg and thus several local interviews could be conducted if there was a need for it.

Furthermore, as credibility of qualitative research is mainly determined by the match between the respondents constructions and researchers representation of these, it is important to address that respondents themselves can play a central role in pinpointing when false interpretations are made by the researcher (Halldórsson & Aastrup, 2003). The technique of asking follow-up questions to vague or ambiguous responses from interviewees is often called *probing* (Barriball & While, 1994) and would have been hard to achieve without using the semi-structured interview approach to collect qualitative data.

All interviewees were given questions in similar wording and sequence, to ensure that collected qualitative data could be analysed further in a cross-case analysis through coding, comparing and refutation.

5 External single case reports

In the following chapter, the empirical findings from several interviews from three of the six external case companies will be described. The chapter follows a pre-outlined structure based on the following themes: organisation and processes, maturity in eSourcing utilisation, aspects of choosing sourcing approach and what elements are considered when configuring eRA events. A within-case analysis is then presented at the end of each case report.

Case companies Alpha, Beta and Delta provided sufficient level of data saturation as they covered the main components which are discussed in the report. Whereas Gamma, Epsilon and Zeta mainly confirmed the findings, but was not as full in their data coverage. Thus the three remaining case reports and their within analyses of the case companies Gamma, Epsilon and Zeta are put in Appendix C for the interested reader to digest further, while maintaining an overall to-the-point structure of the report.

5.1 Case Alpha

Alpha is a global manufacturer with a broad focus on machinery components such as bearings, seals, lubrication and lubrication systems, maintenance products, mechatronics products. Alpha is an industrial company which is focused on B2B customer segments.

There are currently just over 130 production facilities, as well as another 15 technology centers which are running R&D operations. With their global and scattered production footprint there is a palpable level of decentralisation within the organisational structure. Meanwhile functions such as purchasing are run with a center-led but geographically spread category management organisation.

5.1.1 Sourcing organisation and processes

Alpha's purchasing digitalisation journey and implementation of eSourcing followed a major restructuring program of the entire purchasing organisation. This restructuring program was extensive and focused on purchasing strategy development, consolidation of category management and sourcing related roles, redefining all sourcing processes as well as extensively simplifying contractual attributes such as payment terms. There were several factors which led to the purchasing restructuring program being initiated in 2012. Among other factors, Alpha mentioned the following underlying factors:

- Trailing behind peers in regards to both purchasing capabilities and performance
- Low control of quality standard compliance within the supplier selection process
- Dispersed responsibilities within same categories limiting leverage of buying power
- Complex supplier/contract management due to 40.000+ suppliers and 70 different payment terms
- Complex matrix purchasing organisation with 100+ different purchasing titles

In addition to realising the burning platform through the acknowledgement of the factors above, Alpha identified which were the key suppliers and where there was room for supplier and category consolidation. In regards to direct material, just under 6% of the total amount of suppliers (230 out of 4000) stood for 80% of the spend in direct material in 2012. In regards to indirect material, the equivalent amount of key suppliers which stood for 80% of indirect material spend was just under 4% (1000 out of 25.500 suppliers).

In regards to finding the appropriate purchasing organisation setup, Alpha consolidated their category structure and 100+ different purchasing roles into a more structured and centre-led matrix organisation. Although the restructuring program had a highly centralising effect, Alpha still employs 450 purchasing professionals spread over 67 sites in 25 different countries. These professionals are divided into roles such as category managers, factory buyers and operational

purchasers. Currently there is approximately a 50/50 split between indirect and direct categories in regards to spend levels.

Within their main business area, the bearing operations unit, the purchasing matrix organisation now has the structure as seen in Figure 5.1. With this new purchasing organisational structure, Alpha attained global category management responsibilities which enabled category synergies to be achieved across business areas. Within each of the high level global categories, there are sub-categories and more focused category management practices. Note that all purchasing operations are consolidated under Bearing Operations whereas the central Chief Purchasing Officer is reported to under the Purchasing and Integrated Cost Reduction unit. Figure 5.2 further zooms in on the category structure of the category *Indirect Materials and Services*, which has the most extensive high-level and global structure of the categories mentioned in Figure 5.1. It should however be mentioned that the different direct categories also maintain a similar structure. Within the Indirect Materials and Services category, Alpha employs about 100 purchasing professionals. The roles are broadly defined as part of either two divisions: 1) a *global category team* which on a high level manages the majority of spend, as well as 2) *category teams working closely with local sites* through category networks (which in turn are led by the global category managers).

Alpha has an ambitious purchasing digitalisation agenda and have emphasised the focus on both internal and external analysis in the early steps of strategic sourcing projects. Thus they have centralised a set of roles such as skilled business analysts and change management professionals into a support team referred to as Strategy and Business Transformation, as seen in Figure 5.1. This team, which consists of 5 people, is responsible for rolling out eSourcing and source-to-contract platforms and practices throughout the organisation and supports in internal and external analyses for strategic sourcing projects. This responsibility included ensuring both internal and external eSourcing adoption, which typically meant keeping close track of internal eSourcing and eRA adoption and external supplier event conversion statistics.

As part of Alpha's strive to boost purchasing performance, the cross-functionality in regards to specification management and sourcing methodology has been improved over time. Several years ago, this process improvement was branded Integrated Cost Reduction (ICR). The ICR approach has been existing at Alpha for long, but in 2015 it was further emphasized and prioritized within Alpha's World-class manufacturing strategy. With this approach, ICR delivers savings by replacing over-specified components, processes or materials with lower cost solutions that meet the customer's needs. It is built on three initial and important process steps in the boot-up of every sourcing process:

1) *Review technical solutions*
2) *Optimize sourcing*
3) *Review product specification*.

ICR is essentially about how Alpha can set the right specifications on their products and the processes, components as well as the materials used to make them. Through these process steps Alpha aims to provide the customer with the function and performance that they value, without compromising on quality and at the best possible cost. The process steps do however require a structured and coordinated effort involving customers, product design, application engineering, production engineering, validation testing and purchasing.

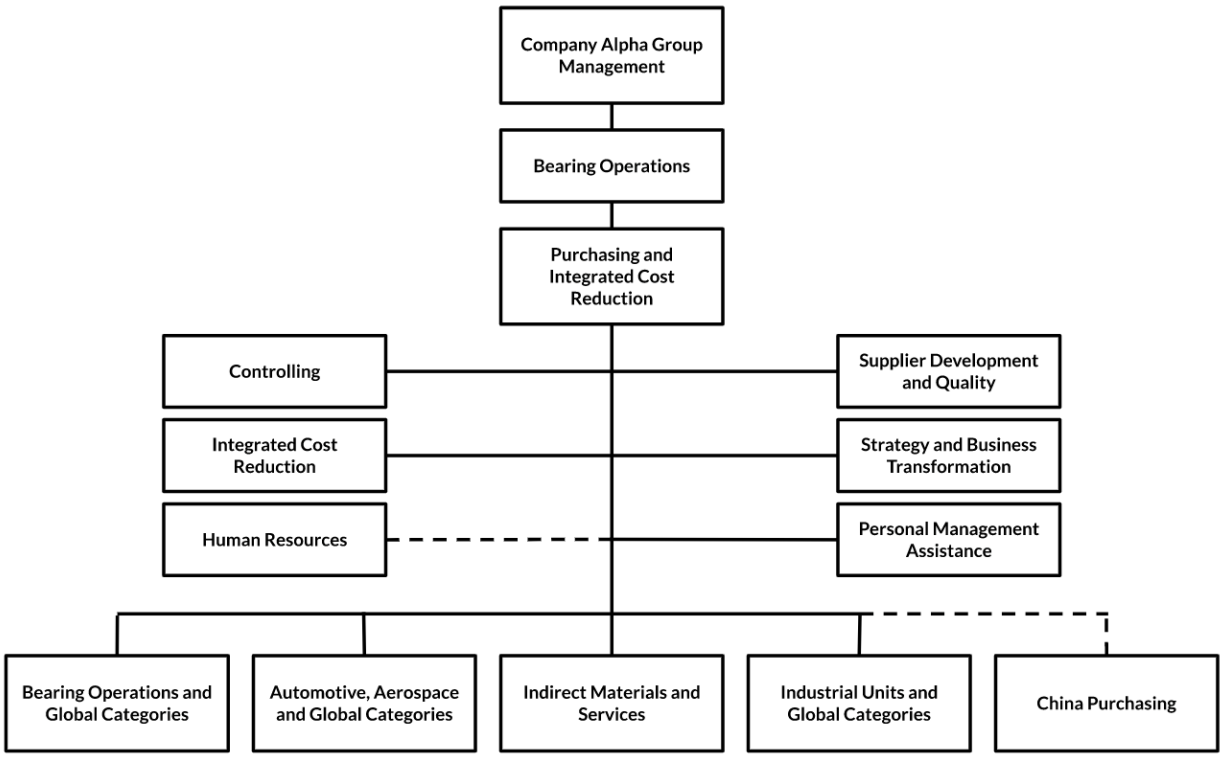

Figure 5.1. Alpha's purchasing organisation structure.

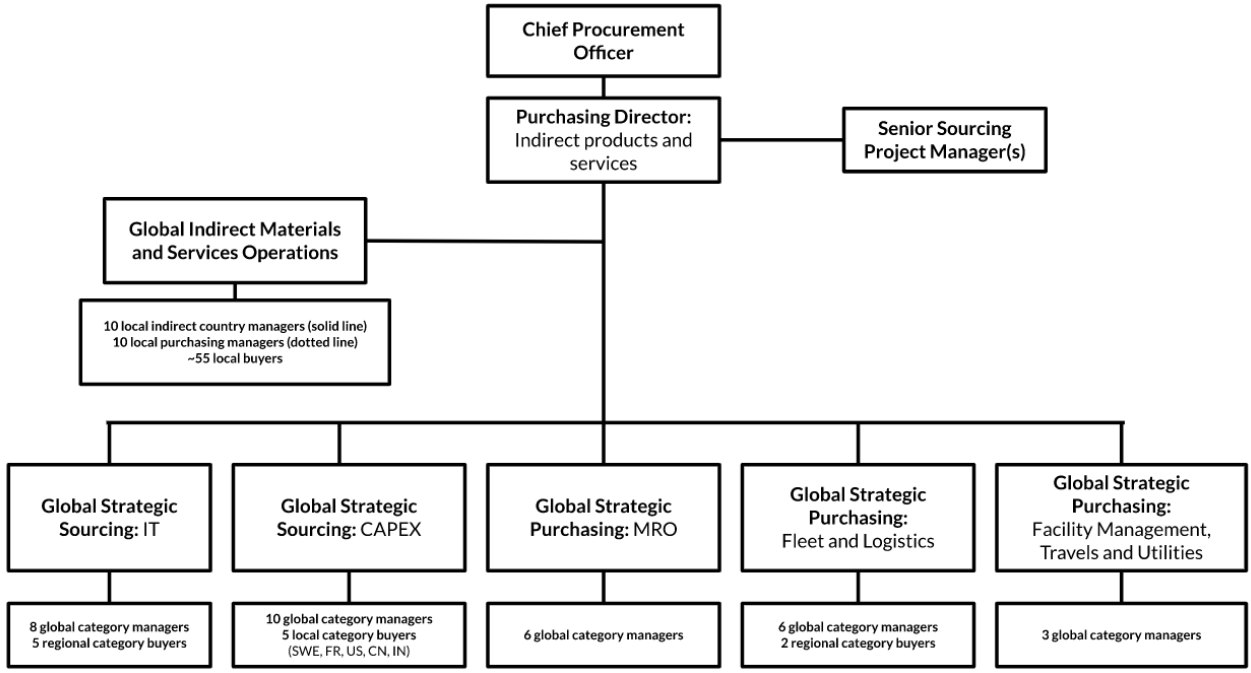

Figure 5.2. Alpha's Indirect Materials and Services category organisation.

The new organisational structure has required extensive work with alignment of the processes, definitions and responsibilities. To align the new and globally dispersed purchasing organisation structure with uniform sourcing process definitions, Alpha defined two different sourcing processes:

- *Standard sourcing project:* This is the more frequent sourcing project, which is done when there is a defined specification at hand and when the supplier base is known. The standard sourcing projects follow 3 process steps as seen in Figure 5.3. The main difference from strategic sourcing projects is that there is no need to develop sourcing and category strategies within the project timeline.

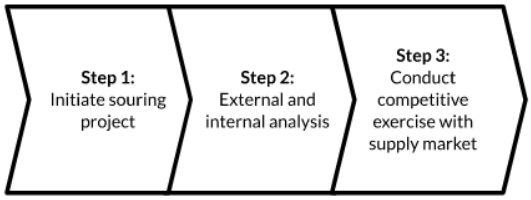

Figure 5.3. Alpha's standard sourcing project process structure.

- *Strategic sourcing project:* The more extensive kind of sourcing project which is done when the supplier base is unknown and when there is little or no overview of the characteristics of what is to be purchased. The strategic sourcing projects require more cross-functional collaboration and follow 7 process steps which are illustrated in Figure 5.4. Strategic sourcing projects go through 5 business gates, where central approval or follow-up is required prior to progressing further into the project.

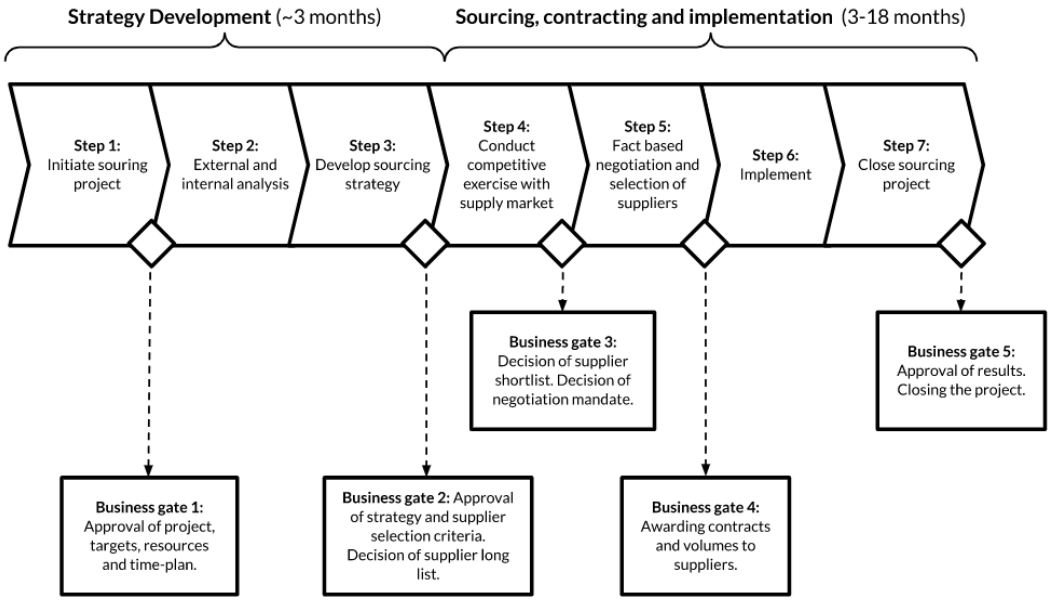

Figure 5.4. Alpha's strategic sourcing project process structure.

Every strategic sourcing project needs to be approved by the purchasing management based on its project targets, required resources and its anticipated business value. Once the strategic sourcing project has been approved by purchasing management and initiated by the corresponding category manager, the Strategy and Business Transformation team is responsible for conduction of different external and internal analyses. These analyses typically include supply market scouting, Kraljic mapping, Porter's five forces, SWOT analyses and cost breakdown and regression analysis of the suppliers' cost models. These analyses are later mainly used as foundation for the category and sourcing strategies as well as fuel for negotiations in the later stages of the sourcing project. The analysis step is followed by the

development of sourcing strategies. These strategies typically include an overview of the type of suppliers which are to be sourced from, how to maintain a cost efficient category over time, what the supply chain setup and footprint should look like and what sustainability actions are to be taken etc. This type of strategy development has been significantly simplified by having an eSourcing platform to work out of for each sourcing project, as it has improved the cross-functionality of each activity. As reference it has enabled Alpha to go through the entire strategy development phase in 3 months, whereas only the external and internal analysis step could previously take up to 1 year.

Steps 4-7 touch upon the choice of sourcing approach and the potential use of eRAs and will thus be described further in the following case sections. The SAP Ariba platform has been an important part for Alpha in being able to leverage their size and achieving organisation-wide transparency, visibility and alignment in their global organisation in these sourcing projects. The platform covers contract management, operational procurement processes and invoice management. Both on-premise and cloud versions of the procure-to-pay parts are available, whereas source-to-contract modules require constant access and are thus isolated to the cloud. In addition to this software, Alpha are using Sievo which is a procurement analytics software. By adding Sievo on top of SAP Ariba, Alpha has acquired analytical infrastructure for spend analysis, consolidating payment terms and sourcing opportunity identification.

With the purchasing organisation restructured and the category spend being more consolidated within Alpha's global category management organisation, it has been easier to identify potential for cost savings in purchasing. To be able to prioritise among the identified savings opportunities, Alpha defined three different sourcing waves with varying savings potentials and difficulty differences mainly due to increased requirements within organisational alignment and data management. The initial sourcing plan with its three waves is shown in Figure 5.5.

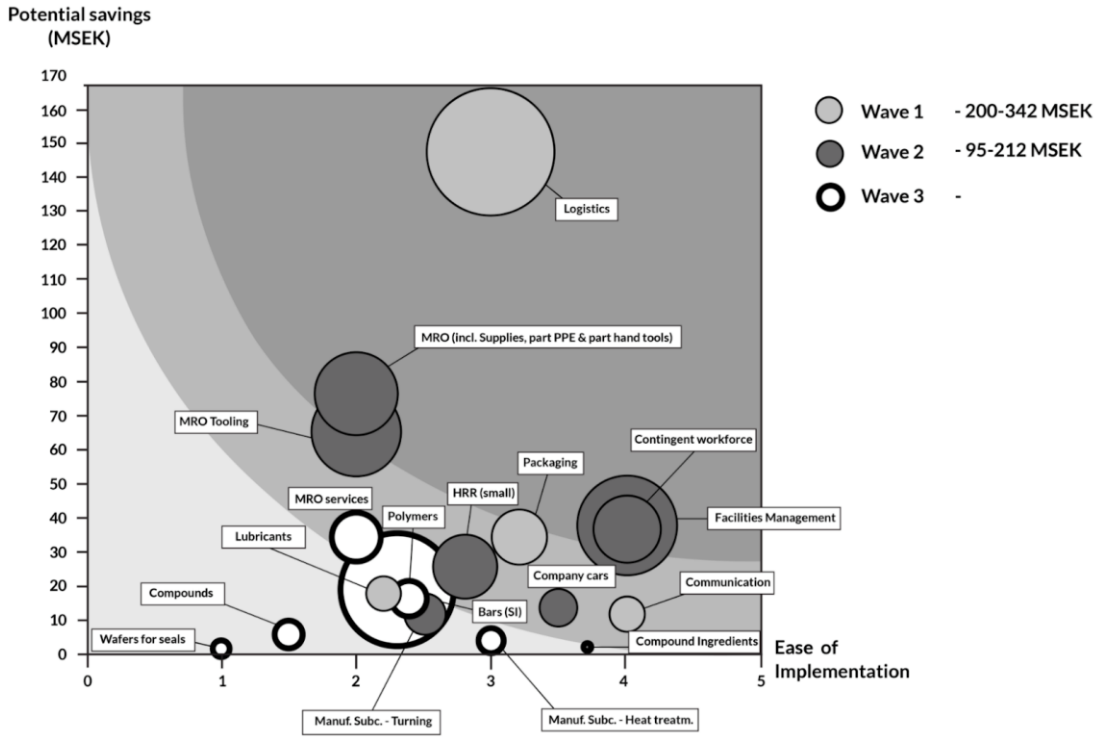

Figure 5.5. Alpha's initial sourcing plan with its three waves.

5.1.2 Maturity in eSourcing utilisation

Alpha rolled out the SAP Ariba source-to-contract platform 3 years ago. The setup in the SAP Ariba platform has been developed based on industry best practice, rather than the previous sourcing process structure. The developed SAP Ariba sourcing project structure is internally

referred to as STAR at Alpha and using it has been made mandatory for all sourcing projects. This means that Alpha conducts all their sourcing projects through the platform, where each strategic sourcing project goes through the steps shown in Figure 5.4 whereas a standard sourcing project normally goes through the steps shown in Figure 5.3. It is important to notice that even with eRFx events certain steps such as F2F negotiations sometimes take place outside the platform, whereas the results of actions done outside the platform are still registered in the platform for future reference.

There is only one sourcing project workflow put into the platform and this workflow is built upon a high level of empowerment, meaning there are no required approvals from management inside the system (although there are certain approval steps in the process definition, as described above). The reasoning behind this setup is that all purchasing professionals are supposed to work in a uniform process compliant way, while being able to do so efficiently with maintained high speed. It should however be mentioned that for new contracts with substantial spend levels, Alpha do have an implemented approval step inside the platform in order to initiate a sourcing project.

Alpha are using an advanced contract module inside SAP Ariba, which works as a drag-and-drop mechanism with a set of pre-approved clauses which are fitting for the sourcing context and the corresponding supplier which is to be contracted. This setup is preferred at Alpha as opposed to the more traditional way of drawing up very big and complex legal contracts which are hedging for the most extreme legal situations which could occur for all sorts of sourcing situations.

In regards to eRAs, Alpha has not gone entirely live yet. The eRA setup in their SAP Ariba platform has been configured and ready to go live for a while. A test auction was scheduled to early 2020, but had to be postponed in an unforeseeable future due to the Covid-19 pandemic.

5.1.3 Important aspects of choosing sourcing approach

In regards to deciding when and to which extent competitive supply market exercises are to be conducted, the Kraljic matrix and the corresponding supplier segmentation is Alpha's primary analytical tools.

Many of the industry segments which Alpha is focused on, e.g. automotive and aerospace, have extensive requirements in regards to supplier certification and quality standards. In addition, given the highly engineering driven nature of their products and the mechanically functional values they add for these customers, it is not uncommon that their purchasing specifications become supplier specific due to the downstream bills of materials.

Almost all sourcing projects, unless strategic relationships are in place, go through competitive exercises with the supply market which for Alpha usually means RFQs. But all sourcing projects for strategic categories are ended with F2F follow-up conversations and negotiations mainly to develop the supplier relationship. An example of where such F2F practices have been proven important for Alpha is within the steel category, which is their most important and core material category. For this category, only conducting eRFx is deemed insufficient to handle the category complexities and maintaining a tight enough relationship with the approved suppliers.

In single sourcing situations, either the strategic or standard sourcing project process structure (depending on the sourcing context) are still followed. It is argued that for sourcing situations with levels of monopoly or oligopoly, the analysis step is even more important. For example within the Porter's Five Forces model the search for substitutes can more often than not prove itself a true cost saver.

In regards to the suitability of using eRAs, Alpha's decision tree will be based upon the following factors:

- *The characteristics of the product or service to be sourced:* This is assessed by answering two questions - How complex is the product or service by nature? Can the product or service be made comparable throughout the sourcing process or not?
- *The characteristics of the supply market:* Are there 3 or more approved suppliers for the goods or service?
- *The level of spread among the represented cost models:* Can opportunities for cost reduction between different supplier's cost structures be identified and sufficiently leveraged in a negotiation phase.

From a supplier relationship and category perspective, eRAs are considered applicable to both the leverage, non-critical and strategic quadrants inside the Kraljic matrix whereas the suitability is considered limited in bottleneck quadrant. However, it is not the segmentation based on Kraljic matrix which determines eRA applicability, but rather the factors mentioned above.

5.1.4 Elements considered when configuring eRA processes

Alpha's eRA utilisation will be implemented with full buyer commitment. This is because Alpha considers anything else to be unethical to participating suppliers. They anticipate that this setup will require more extensive preparatory activities prior to the eRA compared to using eRAs only for "true price discovery". But still it is believed that a setup with full buyer commitment can draw upon better performance due to recurring eRA participation among invited suppliers.

The auction types which are to be used in Alpha's auction programme will only be reverse auctions with downward price development (referred to as English reverse auctions). Although acknowledging that the big amount of different auction types can be used in an optimal way to achieve even better eRA results, it is considered to come down to a matter of organisational adoption and eRA outcome.

Using eRAs will not be released freely in the SAP Ariba platform at first, but rather be limited to specific users. Initially the right to conduct eRA events will be put on the Strategy and Business Transformation team. This is due to the fact that they consider their eRA setup to be more complex in nature compared to their usual way of conducting eRFx events and F2F negotiations. Furthermore, the Strategy and Business Transformation director wants to have a good idea of how the implementation progresses as well as develop very high capabilities internally in regards to leveraging substantial eRA performance.

The post-auction communication with eRA winners will be both by phone and email (and potentially by F2F startup meetings in rare cases, if needed). Post-auction communication towards non-winning suppliers will be conducted by only email from inside the platform.

5.1.5 Within-case analysis

Case Alpha proved very insightful as the company had initiated the eSourcing platform three years ago but still worked with the implementation, especially regarding the eRAs. The informant was very knowledgeable as she had studied available best practices of eSourcing and tried to replicate it into the centralised purchasing organisation at Alpha.

The within-case analysis is divided into two parts, with the first analysing the aspects of choosing sourcing approach. Mainly comparing how the case company addresses the four aspects found in literature, in addition a fifth aspect was identified in the case study and will be analysed. The second part will analyse the configuration elements critical to eRA success, by comparing the six configuration elements from literature and two new elements found in literature.

Aspects of choosing sourcing approach

The first aspect of choosing a sourcing approach is the benefits of sourcing digitalisation and was described by Schnellbächer et al. (2018). In Table 5.1 the expressed benefits of digitalisation at Alpha is shown. The benefits of digital sourcing as identified by Schnellbächer et al (2018) was savings, speed, risk, quality and innovation. But Alpha mainly expressed the benefits of cost reductions (savings) and time savings (speed), the improved cross-functional workflow could be argued to affect and improve risk, quality and innovation but it was not discussed during the interview. Therefore it is believed that these benefits were at the best only moderate.

The most important benefit of digital sourcing expressed by Alpha was the improvement of data management practices as the digital systems helped both acquiring, storing and finding data much easier. This is especially true as the purchasing organisation at Alpha is centralised and the team can together put guidelines in how to manage the data to keep it clean and useful. This data was not only used for improved performance management but also in order to create better supply market analysis which benefits the other parts of the sourcing process.

Table 5.1. Expected and expressed benefits of digitalisation at Alpha.

Benefits of digitalisation	Alpha
Better data management	x
Increased supplier invitations	
Direct cost reductions	x
Improved cross-functional workflow	x
Process time savings	x
Exploiting frontier technologies	

In theory the second important aspect of choosing a sourcing approach was the analytical foundation as IBX Group (2009) showed that analysis, e.g. Kraljic mapping can help understanding which sourcing approaches are applicable and which are not. Both a highly skilled sourcing analyst team and a category management team was present at the central level at Alpha and the individuals in these teams had very strong analytical methods to help them in the sourcing process seen in Table 5.2. This strong analytical foundation could also help other purchasers in the organisation to avoid barriers which will be discussed below.

To help implement eSourcing and let purchasers shift from traditional sourcing processes into digital processes an internal eSourcing consultant team was present to help out and educate purchasers. These consultants can help to determine which sourcing approach is appropriate by their sheer knowledge, which is very important for beginners using eSourcing.

The extensive category management and thorough analysis helped Alpha to understand where to begin the implementation for eSourcing and the use of three ‘waves’ most certainly helped the organisation understand the value of eSourcing. Not only training personnel in using the system, but also showing the benefits it can bring will help the perceived value of the sourcing approaches using eSourcing. By analysing the categories the purchasers could choose more accurately between competitive sourcing approaches such as sending out eRFx to multiple suppliers or less competitive as only negotiating with one supplier. The difference lies in the expected cost reductions of each project and the importance of the supplier relationship within each category.

As explained by the informant at Alpha the data infrastructure at any company could always be improved, but at this point it was functioning sufficiently. Since the goal of the question was to understand if the company was hindered in their analysis processes by the data infrastructure the answer was interpreted as that the data infrastructure was sufficient.

Table 5.2. Structures of conducting analysis at Alpha.

Aspect of analytical foundation	Alpha
Organisational structure in purchasing	Center-led hybrid
Central sourcing analyst team	x
Central category management team	x
Internal eSourcing consultant team	x
Data infrastructure	Sufficient

The third aspect of choosing a sourcing approach are the barriers preventing competitive supply market exercises to be performed as highlighted in theory by Gelderman & van Weele (2003). This was a major concern for Alpha and often forced them to conduct direct negotiation with a single supplier, which was also a reason to why a strong central analyst team existed so that they could find new suppliers or evaluate the risks of only having single sourcing. In Table 5.3 the different barriers are highlighted.

Table 5.3. Highlighted barriers for competitive supply market exercises at Alpha.

Highlighted barrier	Alpha
Downstream bill of materials	x
Supplier certification requirements	x
Lack of supply market analysis	x
Difficult supplier approval processes	x
Geographically bound supplier base	
High switching costs	x
Proprietary technology, patent positions	

The last aspect found in literature was the barriers for achieving organisational compliance, this was brought forward by Schoenheer (2019, p. 21) but it was mostly not experienced by Alpha. Out of the six different barriers proposed by Schoenherr (2019, p. 21) only the *internal resistance* was found as a barrier, as a reluctance to change always exists.

The Alpha had embraced eSourcing fully making it mandatory to use in all sourcing processes. Plenty of work went into the implementation of it as a completely new sourcing process and organisation was created. This commitment to eSourcing meant that the traditional sourcing approaches were non-existent at Alpha today and if a particular purchaser still wished to do anything outside the eSourcing platform the results still had to be put into the system afterwards, making a huge incentive to adopting the eSourcing processes. The restructuring of the organisation probably helped the shift into a new position as the traditional sourcing processes were structures of the old organisation. The main reasoning had been to improve the outdated existing sourcing processes but the changes proved useful as it did not only help the purchasing department but also the cross-functional flow with clearer communication between stakeholders using the system. The integration of the eSourcing platform with the company ERP-system enabled updated contract management and a visibility and transparency in the processes that did not exist before.

To help purchasers adapt to the new changes a series of methods was used in order to help achieving compliance with the new process as seen in Table 5.4. Most notably a central eSourcing team was present who worked solely with the adoption of digital sourcing processes, they also facilitated all the training and acted as internal consultants to help answer questions or guide purchasers using the platform.

Table 5.4. Methods for achieving organisational compliance at Alpha.

Methods for achieving compliance	Alpha
Dedicated eSourcing team	x
Centrally facilitated training	x
eSourcing performance management	x
Master-data management	
Internal consultants or super users	x

After interviewing all the case companies a final aspect of choosing a sourcing approach was found. Alpha had restructured their whole sourcing process and integrated the eSourcing platform into, shown in Table 5.5.

Because the sourcing process was integrated with eSourcing and the mandatory use of eSourcing the only choice of sourcing approaches was between using eRFx or eRA but as clearly pointed out by the informant the two are not interchangeable. In the new standard process an eRFx is always present and at Alpha an eRFx would always precede an eRA. Note that an eRFx could be performed without continuing to create an eRA event afterwards. The sourcing approach of 'No RFx' always exist in some sense but as everything has to be logged into the eSourcing platform it would still be easier to send an eRFx to only one supplier in the future than having a dialogue outside the system and then fill in all details afterwards, nothing directly prevents a purchaser from doing this but common sense.

Table 5.5. Utilised eSourcing discipline at Alpha.

eSourcing focus	Alpha
Primarily sourcing process integration	x
Primarily increased supplier competition	

Configuration elements critical to eRA success

Alpha had not fully implemented the eRA program yet, but had done the preparatory work of identifying opportunities and setting provisional guidelines for how the eRA program should be conducted, seen in Table 5.6.

In the eRA program Alpha especially valued the buyer commitment as important and that it should always be full commitment, this is described as an auction-determined award rule by Jap (2007). Full buyer commitment does find the market price as the contract will be distributed at the end of the auction with no exceptions, it is also a fair process where the participating suppliers know that they will win the contract if they have the leading bid when the auction ends. Because of always having full buyer commitment, suppliers must always be approved before being invited to the eRA as Alpha cannot risk awarding the contract to a company which will not be approved in a later phase.

During any eRA different levels of bid disclosure can be used but the informant was clear to note that only limited disclosure would ever be used. Having only limited disclosure does protect the suppliers from other suppliers acting unethical by collecting market data in the prices the companies place in the bids. This mitigation strategy for unethical behaviour is consistent with literature as Carter et al. (2004). With this security of protected market data the participants are more inclined to put their best offer to bid in the eRA.

Table 5.6. Configuration elements of the governing structure in eRA events.

Principle, policy or guideline	Alpha
Level of buyer commitment	Internal policy
Supplier participation principles	Only approved
Level of bid disclosure	Limited disclosure
Policies regarding bid disclosure	Internal policy
Defined ethical guidelines	Yes

Alpha did not see any problem of using eRAs as an alternative to direct negotiations in any supplier segment, seen in Table 5.7. This does contradict theory, such as Arnold et al. (2005), that eRAs should not be conducted with important suppliers. The informant was still clear that the supplier relationship management was critical in the use of eRAs and their recurrence. The informant was very clear that purchasers must not avoid putting any suppliers up for market competition. Alpha has and highly values several strategic partnerships but maintains the position that all relationships must be regularly tested to understand if they still are efficient. How the purchasers communicate with the suppliers is the important part, they should not be careless or try to distance themselves with any supplier.

Table 5.7. eRA utilisation and supplier relationship management.

SRM related eRA guidelines	Alpha
eRA use principle based on SRM segments	No
SRM impact on eRA recurrence	Critical

When implementing eSourcing one of the most important benefits was the better data management that digital sourcing processes brought and as seen in Table 5.8 Alpha has clearly defined the data infrastructure. This configuration element was not one found in the literature but one very important for Alpha in their eSourcing platform and thus eRA program. The data infrastructure does not only help the purchasers in the sourcing process with performance management but it does also help them make supplier bids comparable. Which might be the most important configuration element to set in any individual eRA event as stated in several literature sources (Emiliani, 2000; Smeltzer & Carr, 2003; Beall et al., 2003; Wagner & Schwab, 2004; Carter et al., 2004; Arnold et al., 2005; Elmaghraby, 2007; Amelinckx et al., 2008; Pawar et al., 2017).

Table 5.8. eRA data infrastructure

eRA data infrastructure	Alpha
Defined data infrastructure/strategy	Yes
Data infrastructure defined with clear focus on eRA performance management	Yes
Deployment of eRA master-data management	Central

In the eRA program the exact design of eRAs had not been fully decided upon yet, but the initial decided eRA settings are shown in Table 5.9. However, the auction types with downward movement in price were preferred as they were more simple. An eRA event can have different settings in the award criteria, it could be only price or multivariable award criterias (Beall et al., 2003). Alpha did put emphasis on that an auction should not be used if not the supplier bids could be made comparable and therefore only price would be used as the award criteria. The full buyer commitment that Alpha intends to put into policy will by default turn the eRA mechanism into a contract allocation rather than a price discovery (Elmaghraby, 2007).

Because the sourcing process has been reengineered with greater emphasis on analysis and that the eRA mechanism is of the contract allocation type the balance weight will be distributed more to the pre auction phase than post auction. Very similar to the ideas brought by Emiliani (2000).

Table 5.9. Configuring the eRA design.

eRA design parameters	Alpha
Auction type	English
Main award criterias	Price
eRA mechanism	Contract allocation
Event length	N/A
Closing rules	N/A
Pre vs. post auction balance weight	Pre auction

As stated the balance weight at Alpha tends towards the pre auction phases and the preparations are key to this. In Table 5.10 it is seen that Alpha puts high focus on these preparations. The informant at Alpha was particularly careful to point out that the supply market analysis and category analysis should be performed regardless of conducting an eRA or not. The analytical foundation should not differ depending on sourcing approach, the results of the analysis should rather determine the sourcing approach. The analysis, both of the supply market and the category, is the step that will help the purchaser to understand if the specifications are clear enough and that the supplier bids will be comparable. In Arnold et al. (2005) the analysis helps to understand the "Fitness of approach", i.e. if an eRA is the appropriate sourcing approach or not.

Alpha did also express that training should be conducted for all stakeholders, much in consistency with Beall et al. (2003) who advocates that mock auctions should be performed for all participants to understand the technology and functions in the software before entering the live eRA event.

Table 5.10. Preparing the eRA event.

eRA event preparations	Alpha
Supply market analysis	Yes
Category analysis	Yes
Importance of clear specification	Very important
Pre-qualification of participants	Yes
Purchaser training	Yes
Supplier training	Yes

As Alpha is not fully operational with their eRA program the informant did not wish to give any certain answers into the configuration elements of supplier bid engagement as seen in Table 5.11.

Table 5.11. Configuration elements of supplier bid engagement

Improving supplier bid engagement	Alpha
Supply market competitiveness	N/A
Contract minimum value	N/A
Contract max value	N/A
Bundling and lotting strategies	N/A
Minimum number of auction participants	N/A
Maximum number of auction participants	N/A

Table 5.12 displays the eRA process integration at Alpha. The eSourcing implementation at Alpha meant that the eRA program will be integrated into the new redefined sourcing process. As the process will be redefined a lot of effort has been to find the best practices and create the new sourcing process according to them, but as the eRA program is yet to be operationalised the work is not complete. But it is already now clear that external best practices have been

identified and will affect Alpha's new sourcing process and that an extended analysis phase will help to analyse the fitness of using eRAs in any sourcing process.

Table 5.12. eRA process integration.

eRA process integration	Alpha
eRA impact on sourcing process	Redefined
Sourcing process altered by internally developed best practices	Not yet
Sourcing process altered by identified external best practices	Yes
Extended analysis phase within sourcing projects to adhere to eRA fitness analysis	Yes

As with the eRA process integration the eRA infrastructure integration is not yet completed either seen in Table 5.13. But as the organisation is centralised and eSourcing in general has been implemented several of the configuration elements are already in place. Training will be given to all purchasers when the eRA program starts, and this will be led by the eSourcing team that is already appointed.

In the centralised organisation of Alpha an analyst team will ensure that all eRAs and initially this team is set to operate the actual event in the eSourcing system. This is to both to relieve the category managers in their work but also a security that the eRAs will be conducted properly, especially in the beginning of the implementation. Therefore category managers do not have to learn the new skills, helping the change to be smoother. The system which eRAs will be conducted on, SAP Ariba, is integrated to the ERP-system and the data will be available in the whole IT environment, helping the cross-functionality at Alpha. Having such integration does need a mature system architecture (Beall et al., 2003), but with all of the efforts that Alpha previously has gone through with integrating IT-systems it is believed that the eRA program will be integrated smoothly.

Table 5.13. eRA infrastructure integration (system and organisation)

eRA infrastructure integration	Alpha
eRA (organisation) infrastructure integration	Yes
eSourcing team facilitating organisational eRA training	Eventually
Central analyst team ensuring eRA applicability	Yes
Central eRA team conducting all eRAs	Yes
Required category manager skills impacted by eRA utilisation	No
Emphasis on central master-data management	No
eSourcing and eRA data generation integrated with other IT systems	Yes

A very important aspect of using eSourcing for Alpha was the possibility to measure performance. In Table 5.14 the eRA performance management at Alpha is shown. This was not a direct configuration element found in theory but the strategic alignment of any tool or process is important and therefore is addressed here. The performance measurement at Alpha needed KPIs regarding savings from eRAs, but measuring the suppliers participation and internal adoption was equally important as this will help the central eSourcing team to understand where to prioritise their resources. The data infrastructure is therefore considered critical for Alpha in their continuous eRA program.

Table 5.14. eRA performance management

eRA performance management	Alpha
KPIs regarding realised savings from eRAs	Yes
KPIs regarding supplier eRA conversion	Yes
KPIs regarding internal eRA adoption	Yes
Data infrastructure considered critical for high level eRA performance management	Yes

5.2 Case Beta

Beta is a global manufacturing company which produces household and industrial vacuum cleaners. Their industry is technologically high-paced, which means that they have needed to maintain a high level of product innovation in order to maintain their strong market position.

Beta has a relatively strong distributor network. It distributes and sells its products in over 100 countries and the total annual sales amounts to about 1 billion €. Beta's production footprint includes Asia, the Americas and Europe.

5.2.1 Sourcing organisation and processes

Beta's purchasing organisation matches its overall global corporation, with several different roles spanning from different types of sourcing to operational purchasing which are spread out over the company's global footprint. These mentioned roles were mainly:

- *Category Managers:* A both strategic and tactical role, mainly located at central headquarters as well as the main production sites. Category managers at Beta are responsible for developing and overseeing the overall category strategies and the strategic sourcing practices of specific contracts within their categories. Category managers are also one of the main users of the strategic sourcing suite in SAP Ariba.
- *Sourcing Project Managers:* A role with responsibility of coordinating the procurement activities required for new product launches, new technologies and new suppliers. Provide Purchasing interface to Engineering on all external supplier activities and manage the supply base to attain quality, delivery, cost and technology goals. Sourcing project managers also lead coordination of resources and schedules between multiple departments including R&D, Cost Accounting, Logistics, Materials, Production and daily purchasing to assist in the development launch and continuation support of production in their regions. Sourcing project managers are also one of the main users of the strategic sourcing suite in SAP Ariba.
- *Strategic Buyers:* A role with some sourcing responsibilities, but mainly linked to continual savings projects and analysis of retail price indexes. In practice a strategic buyer works with negotiations with current suppliers, development of price increase mitigation strategies, identification of savings opportunities and development of supplier consolidation strategies.
- *Operational Buyers:* An operational role, working with purchasing from suppliers early in the procure-to-pay operations, i.e. buying day-to-day on existing supplier contracts.

At Beta there are three different sourcing processes, one for each of their different category types as they see it:

- *Direct category sourcing process:* Focuses mostly on itemisation and bundling logics. The category managers own the budget. Direct categories are focused extensively at Beta since they are an engineering and manufacturing company highly involved with innovation. Interfaces between e.g. R&D and sourcing professionals are facilitated inside the SAP Ariba platform.
- *Indirect category sourcing process:* Contract overview is to be used to achieve cross-company synergies. Since there are more stakeholders involved usually, there are several milestones attached to indirect sourcing processes. e.g. project sponsor approval of budget, scope and strategy. These milestones and the interfaces between stakeholders are facilitated by the SAP Ariba platform.
- *Sourcing process for developing business:* The sourcing process for developing categories are not particularly fixed. The focus is instead on limiting the restraining of the innovation and evolving nature in the product development projects.

At Beta there has been a high level of category management in practice, especially in regards to direct material categories. Indirect material categories have lately, despite existing indirect

category strategies and defined processes, been managed in a more ad-hoc and unstructured manner and with unclearly assigned responsibilities. The less structured way of working with indirect categories has been an unfortunate development due to purchasing restructuring programs in combination with untimely loss of certain central and key persons. As a result there is currently only one category manager specifically linked to the indirect purchasing organisation. Instead direct category managers have also had to assist in indirect sourcing activities. The organisational challenges that Beta's indirect procurement organisation are facing have been present during most of the eSourcing implementation project, which in turn have affected in which order eSourcing has been rolled out in the organisation. Indirect categories were to be focused in the implementation project initially. But as direct categories have had a stronger and more experienced team since the implementation project was started, direct categories have instead become the primary focus area of the eSourcing initiative.

In practice it is Beta's category managers who decide which sourcing approaches are to be used in the sourcing processes related to their categories. The only requirement is that the process is documented in the SAP Ariba source-to-contract platform. But due to the high innovation and engineering pace at Beta, their R&D function has had substantial mandates in regards to what the supplier selection process looks like. Those R&D mandates go for both direct categories and developing business, since the process has been developed this way with a clear product perspective in mind. Hence R&D and category management most often work closely together for these categories both prior to going to market, but also as they progress further into the sourcing and innovation processes. In this regard the SAP Ariba platform has been a shared interface between R&D and the purchasing function which has simplified the cross-functional collaboration between the functions. Partly for this reason it has been made mandatory for category managers and sourcing project managers to initiate all sourcing projects inside the SAP Ariba platform.

Beta uses an internal eSourcing consultant team. This team has been valuable, as sourcing process stakeholders know where to address their questions. But this team also ensures that the supplier database is kept clean and that the training of all stakeholders are going as planned by monitoring supplier event conversion rates and internal eSourcing adoption. Extensive master-data management has been required, mainly as duplicates of supplier profiles are often created when suppliers are invited to the platform to compete in a sourcing process without linking them to an existing profile. Allowing duplicates would in turn mean difficulties in managing supplier approval and certification processes based on the source-to-contract platform supplier database. Thus consolidation of supplier IDs has proven to be required. Another important part of master-data management is ensuring that the category structure is clean and adequate, so that the corresponding reports and category analyses are performed accurately. In order to keep supplier profiles clean, the master-data management responsibility has been put on the internal consultant team. Their internal eSourcing consultant team consists of three roles:

- *Transformation and Innovation Leader:* Has overall responsibility of rolling out all modules and overseeing functionality of the SAP Ariba source-to-contract platform. Maintains a learning administrator responsibility, i.e. ensures all sourcing and category management employees are up and running in the system. Additionally the role is responsible for master-data management inside the source-to-contract platform.
- *Master-data co-administrator:* Assists the Transformation and Innovation Leader in supplier master-data management and other system related administration tasks.
- *Sourcing process specialist:* Facilitates consultation and training sessions in regards to eRFx and eRA events inside the source-to-contract platform. Main area of expertise is digitally facilitated strategic sourcing processes.

Facilitating training sessions in the platform F2F has been another big task put on the internal eSourcing consultant team. Thus the team have had to travel quite much initially so get all relevant stakeholders up and running in their new platform based sourcing processes.

5.2.2 Maturity in eSourcing utilisation

Beta went live in their SAP Ariba source-to-contract platform in March 2019, meaning they were little over a year into their implementation project at the time of interviewing.

In their SAP Ariba source-to-contract platform (called Strategic Sourcing Suite) Beta has enabled the contract management module, sourcing module and supplier lifecycle and performance management module. In addition to these enabled modules, Beta is also using the SAP Ariba source-to-contract platform for supplier approval processes and as supplier certification database.

The use of eSourcing as a whole was sold to Beta on a promise of achieving extraordinary cost savings almost exclusively from conducting eRAs. However in hindsight they have had to re-pitch the idea of using eSourcing internally as an augmented way to achieve overall cross-functional process improvement, in order to get the organisation onboard in their implementation project. Beta argues that their implementation successes so far derive from such cross-functional process improvements, which in turn comes from a series of factors such as:

- Wide-spread internal access to contract databases
- Getting uniformly defined and internally adopted sourcing processes in place
- Documented sourcing processes (clear audit trails) are easier to evaluate
- Simpler onboardings of new colleagues into existing sourcing practices
- Better supplier communication in supplier approval/certification/contract processes
- Cross-functional handling (with central visibility) of contract management

Meanwhile there are still sober expectations at Beta that cost savings will still be achieved by the use of eSourcing on a broader front further into the implementation project. But the main benefits have rather been drawn by establishing clear and uniform sourcing processes through pre-defined but adjustable “sourcing projects” inside the SAP Ariba platform. Through the pre-defined but flexible project structure, corresponding clear audit trails in all sourcing processes have been enabled. Clearly defined sourcing processes and the audit trails in turn have given better and more structured insights as to e.g. when and how suppliers have recently been exposed to market competition through Beta’s sourcing processes. Consequently it has also become easier for Beta’s category managers and sourcing project managers to know when and how different parts of the supplier base’s offerings and pricing can be challenged in the upcoming future. Furthermore, through central storage of e.g. non-disclosure agreements, certifications and supplier approvals and other supplier agreements and documentations, the contract management and supplier lifecycle and performance management modules have proven themselves very valuable to pinpoint clear values of working inside the system. By enabling those modules, the cross-functional process improvements between especially purchasing, R&D, CSR and legal functions have been rather easy to pitch internally for the eSourcing transformation leader. Currently all contracts related to direct categories have been imported into their contract and supplier documentation database, which approximately adds up to 2500 documents. But another 6000 contracts related to the indirect categories are expected once the indirect purchasing organisation has been restructured and employed as planned.

In regards to what a sourcing project by default looks like in Beta’s SAP Ariba platform, they had to set up a broadly defined and adjustable sourcing scope which fit for all sourcing contexts. To get a good idea what a digital sourcing project looks like they had to look externally to get a good feel and understanding of best practices. But in order to make such best practices addressable to Beta’s specific context, it had to be aligned with all internal stakeholders from several different functions. The functional alignment aimed to bridge gaps between what the new digital process was proposed to look like (based on best practices) and the critical internal processes which had to be taken into consideration. The important part which Beta highlighted in regards to this business process reengineering is that “the old” should

not just be moved into the platform. But rather an extensive analysis should be done in regards to what business values are desired from the platform and what process reengineering efforts will be needed to draw upon such values. It was also highlighted that in terms of getting people onboard, it is important to limit the restraining and controlling of employees through milestones and report requirements in the sourcing projects inside the platform.

Beta further made sure that they had a clearly defined high-level category structure which was to be drawn up inside the system. It was early identified that without such a category structure, it would be hard to reap the neat category analysis opportunities which are enabled by an eSourcing compliant organisation. All together, the eSourcing implementation project required extensive process and structure analysis and remodelling prior to suggesting and implementing the new solution. Would they have had the chance to do it again this is one of the steps which they emphasised would have been put more time into.

The use of the strategic sourcing suite in SAP Ariba has been made mandatory for all functions involved in sourcing processes. This approach has been chosen for a series of factors, but one high level reason is that Beta has wanted to draw upon a sourcing transparency with reliable data in the new audit trails. Thus all sourcing processes have needed to be represented in the system. All in all, pushing the system out into the organisation has generally been deemed needed to get a sense of urgency in the implementation. However in order not to restrain their professionals in their way of working too much they have tried to limit the steps in the process which are mandatory to report in the tool such as project milestones and data points. An exception to the professional freedom in sourcing projects can be seen in indirect categories, where a series of required inputs for each sourcing project in SAP Ariba has been made mandatory.

Although the platform has been pushed out, there are still currently several organisational layers of eSourcing maturity in practice. There are some category managers and sourcing project managers that individually are doing all of their eRFQs in the SAP Ariba platform, whereas others have only done part their RFQs inside the platform and some late adopters still require more convincing to even get started with the new setup. Overcoming the struggle of getting late adopters onboard has to a large extent been dependent on managing those employees' fears of being controlled, not having suppliers onboard and to thoroughly manage their learning curve in regards to the platform. Currently between 300-400 eRFQs have been conducted inside the platform during the year that it has been available. Meanwhile only one eRA has been conducted so far, even though the results were above expectations. The use of eRAs has not been rolled out in Beta's organisation according to plan yet. This is because eRAs are considered to be a different ball game in regards to process understanding and the preparatory requirements in regards to high level preparations as well as event specific preparations. Once the indirect procurement organisation is structured again and the adoption of the tool is further in place, they aim at an initial goal of running one eRA per month. The only eRA that was completed so far was conducted on a direct material category (steel components) and the budget for the sourcing project was 350.000 €. It should be noted that the current supplier(s) of that category had recently been subject to quite aggressive negotiations. Despite the recent squeeze in the category, the eRA yielded close to 5% price reductions even after conducting several rounds of eRFQs.

5.2.3 Important aspects of choosing sourcing approach

All in all, the available sourcing approaches at Beta are F2F negotiations, eSourcing platform based RFx processes and eRAs (which are only added after eRFQs). Different approaches are to be combined in larger or more complex sourcing projects, whereas smaller or more simplistic sourcing projects are carried out completely digitally inside the SAP Ariba platform. Generally the setup of a sourcing project, including which approaches to use, is decided by the category manager when the category strategy is developed. However, as a guiding principle Beta has been very firm on that all sourcing projects need to be initiated inside the source-to-contract

platform and at some point in the process all competitive sourcing projects also progress into eRFx. The same approach goes for communication towards suppliers, that if a supplier wants to do business with them they have to get onboard with the process inside the platform.

There are cases, e.g. for very big sourcing projects or when certain cost cutting campaigns have been taking place, when Beta are inviting certain key suppliers to F2F collaboration and negotiation events. In such events, the top management of Beta has been onboard to “set the scene”, explaining the scope of collaboration and to participate in some of the break-out negotiation sessions with the suppliers.

Prior to conducting an eRA, Beta will have as general practice to always conduct one or several eRFQs. Inside the platform the eRFQ can be done with a very broad supplier base, and it is considered not to add too much more work. In turn clarity and comparability in regards to the supplier bids can be achieved. Running several rounds of eRFQ boils down specification complexity and suppliers’ varying abilities to deliver on the defined specifications into comparable bids. If a supplier wants to suggest something new after an eRFQ round, they do it through the SAP Ariba platform. Then the responsible category manager or sourcing project manager has the option to run another eRFQ with updated attributes if the new suggestion is preferred.

Once the eRA programme has been fully implemented, the plan is that eRAs will serve as the final negotiation step succeeding one or many rounds of eRFQ in situations when eRAs are suitable. This is when an optimal and comparable eRFQ setting has been successfully run, if lead time allows it and if the anticipated savings are enough. The transformation and innovation leader at Beta argue that, compared to eRFx, eRAs also require the following in order to be suitable:

- Much better insights of how the source-to-contract platform works
- Clear definition and understanding of where eRA fits in the sourcing process
- Deep understanding of preparatory steps required prior to conducting the eRA
- A set of 3 or more equally competitive suppliers from the last eRFQ round
- Complete comparability among suppliers’ bids from the last eRFQ round
- Suppliers well initiated to the platform specific eRA event procedure

Also single or sole sourcing situations are run as sourcing projects from the platform, but such projects never progress into competitive eRFx. They are still run from inside the platform however, as that is how the central process audit trail and visibility is created.

5.2.4 Elements considered when configuring eRA processes

The use of eRA is seen as a final negotiation step at Beta. All their sourcing processes include eRFx, but ending the process by adding eRAs is only adequate in certain scenarios. The requirements of adding an eRA at the end of a sourcing process are considered to be:

- The person responsible for the corresponding sourcing process is well initiated with their source-to-contract platform
- There are 3 or more competitive suppliers (whereas up to 7 suppliers is considered possible to manage efficiently from a platform support perspective)
- Several rounds of eRFQ have created absolute comparability among quotes

Adding an eRA event to a sourcing process is considered to decrease the negotiation lead time, but it also significantly increases required lead time for adhering to the event preparation requirements. The preparations required before an eRA process are considered to be:

- Achieving comparability
- Informing suppliers of the upcoming eRA event and its timeline

- Set up the auction format inside the eSourcing platform
- Conduct needed communication with invited suppliers prior to the auction
- Run trial auctions with all participating suppliers

Maintaining good and respectful supplier communication is considered crucial by Beta in order to get suppliers onboard. The responsibility of ensuring communication is made correctly has been put on the Category Managers. Having the central administration from the internal eSourcing consultant team has however been helpful in making the supplier communication setup uniform throughout the organisation. Their supplier communication consists of a series of documents: 1) *Personal pre-warning email* stating that once the supplier is invited the platform will send several important emails which might end up in spam-inbox; 2) *Bidder agreements* which are to be signed prior to the eRA participation; and 3) *Supplier eSourcing manual* stating how to sign in to SAP Ariba Network and how to get needed help if the platform is malfunctioning.

Another important element is setting up the actual auction. Beta aims to consistently switch the auction type which are used, as this is believed to maintain a high bid engagement among recurring suppliers by "keeping the suppliers on their toes". In regards to setting up the eRA, Beta have only touched upon what the guidelines will be in regards to when and how the eRA event is to be set up as bundled lots (rather than in a more item-bound one-by-one manner). Such guidelines are however mainly needed for sourcing situations when hundreds of different (but similar) items are to be auctioned at the same time which is rarely the case for Beta. In the auction that Beta did conduct, they used a bonus-malus system to account for switching costs and to maintain a TCO perspective. The current supplier was given a percentage-based bonus compared to other participating suppliers, whereas the bonus-malus system was not communicated to participants prior to the auction since the auction was done with limited bid disclosure. This type of setup will most likely be used in all situations when the bid disclosure is limited. Worth mentioning is that Beta has not yet decided to which extent setting up the auction will be supervised by a central administrator within the internal eSourcing consultant team. Currently the setup is leaning towards that all eRA event designs have to be sent for central approval by the internal eSourcing consultant team. This is because the eRA needs to be set up correctly in the platform and according to what has been communicated to the suppliers. Once the event is underway, there is no going back. The non-existing flexibility in how correctly the eRA setup needs to be stems from that Beta will always go into eRAs with full buyer commitment for ethical reasons. What is bidded on and won is consequently what will be written in the contracts. For the sake of comparability, Beta will never let unapproved suppliers participate in eRA events.

Beta mentions that given the very aggressive nature of the eRA as negotiation practice, fine lines in regards to ethical boundaries are frequently touched upon. Beta considers letting bidders bid against themselves in e.g. dutch auctions, using decoys or letting non-competitive suppliers join in auction events strictly unethical. Such behaviour needs to be avoided by establishing internal ethical guidelines to maintain a good company reputation.

The Transformation and Innovation Leader had developed a set of rules during previous work commitments which are to be followed in order for the company to be able to use eRAs more often in their sourcing processes and to have suppliers consistently onboard. These rules could be summarised to:

- Always go into the auction with full buyer commitment
- Clear communication (with winners and losers suppliers) regarding fairness of eRA
- Clearly defined and followed ethical guidelines
- Maintain good overview over number of available suppliers in each category
- Maintain good overview over which supplier are ready to be "squeezed"

As the eRA serves as the final step in Beta's sourcing process (if eRA is used), the only post-auction activity conducted is signing the contracts and potentially other supplier agreements, and after that it is just a matter of pasting amounts into the price lists and start up the operational procurement operations.

5.2.5 Within-case analysis

The informant at Beta had been headhunted to the company as she had led the transformation into eSourcing at another company before and this was therefore the second eSourcing implementation she was a part of. This gave a very interesting perspective to the case as she could describe their actions more detailed and carefully tell why they had performed certain actions when implementing it.

Aspects of choosing sourcing approach

The benefits of digital sourcing processes were first seen as huge cost savings as the use of eSourcing enabled Beta to conduct eRA and it was promised that these would bring large cost reductions. But when starting to implement eSourcing a more realistic view on the benefits were seen, still with cost savings as a benefit but not as large and not the only benefit. In table 5.15 the benefits expressed by Beta are found for using digital sourcing processes.

The main new benefit seen from eSourcing was the better data management as it could help the sourcing process and the overall workflow in the purchasing organisation. The cost reductions were seen as a part of an overall improvement in sourcing. With better data the purchasers can perform better analysis and this can in turn help them to perform better in negotiations. Schnellbächer et al. (2018) puts forward five benefits of digital sourcing and of these Beta mainly expressed the cost savings and time savings.

All RFx events that previously were held via email or similar have been exported seamlessly in the eSourcing platform with the eRFx's. Because all functionality is kept within the eSourcing platform and only additional benefits are added the choice of sticking with the traditional sourcing would only be desired from conservative users not wanting to learn the new method. The eRFx sourcing approach will be the new standard at Beta. When discussing eRAs the instinct answer was that it always had to be preceded by an eRFx. The company was still early in the implementation of eSourcing but they could already see the benefits of it and therefore it is most likely that they will continue to use the system for the next foreseeable future.

Table 5.15. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Beta
Better data management	x
Increased supplier invitations	
Direct cost reductions	x
Improved cross-functional workflow	x
Process time savings	x
Exploiting frontier technologies	

The second aspect of choosing a sourcing approach are the structures for conducting analysis. Beta had a centralised purchasing organisation with a central category management team to conduct the most of the sourcing processes in terms of spend. When understanding the analytical foundation the category managers had a sufficient data infrastructure to support all of their analytical models used.

For sourcing approaches using eSourcing a central team was available to consult if having problems. This enables a quicker adoption rate in the implementation of eSourcing at Beta.

Table 5.16. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Beta
Organisational structure in purchasing	Centralised
Central sourcing analyst team	
Central category management team	x
Internal eSourcing consultant team	x
Data infrastructure	Sufficient

The third aspect of choosing a sourcing approach are the barriers for competitive supply market exercises (Gelderman & van Weele, 2003) and the highlighted barriers for Beta is displayed in Table 5.17. Beta experienced several categories with limitations to competitive supply market exercises due to requirements of certifications from suppliers. To demand certain certifications does limit the supply base, but it is believed that other departments than purchasing does enjoy benefits from the certifications and hopefully the TCO will be lower because of the ensured quality level that the certifications bring.

Having restrictions on suppliers, e.g. only certified suppliers, puts increased demand on supply market analysis and this was something noted that the purchasers worked a lot with. It is believed that the focus on certifications does simplify the approval processes for suppliers and that this is the reason Beta did not see that as a barrier. But still the switching costs are high and therefore introductions of new suppliers are restricted, encouraging current suppliers relationships to be nurtured and taken care of.

Table 5.17. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Beta
Downstream bill of materials	
Supplier certification requirements	x
Lack of supply market analysis	x
Difficult supplier approval processes	
Geographically bound supplier base	
High switching costs	x
Proprietary technology, patent positions	

From the organisational barriers for reaching compliance as stated by Schoenherr (2019, p. 21) the internal resistance was the only barrier mentioned by Beta. The primary method deployed was the assembling of a dedicated eSourcing transformation team, which the informant was a part of. This team helped the organisation to understand and adapt to eSourcing by conducting training for the category managers and purchasers out in the organisation.

The dedicated eSourcing team controlled and facilitated the master data in the system so that the users could focus on value-adding processes and not be distracted with data errors or other flaws. This helped the users to view eSourcing in more positive light, but also enabled the performance management to be measured with trustworthy data.

The eSourcing team also had sourcing process specialists which could act as internal consultants if any user had problems during any event. Having such experts can also be useful to identify opportunities where eSourcing could be utilised and help push users to adopt eSourcing.

Table 5.18. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Beta
Dedicated eSourcing team	x
Centrally facilitated training	x
eSourcing performance management	x
Master-data management	x
Internal consultants or super users	x

It was clear that eSourcing was implemented in order to integrate digital technologies with the sourcing process. Beta had been promised large cost reductions if utilising these technologies, which the appointed eSourcing team quickly identified to be a huge overstatement. But all the other benefits were still desirable and the project to renew the sourcing process was still implemented.

When implementing the eSourcing platform the old sourcing processes at Beta were outdated and the concept of eSourcing posed an opportunity to rethink and update those old processes. Three new sourcing processes were proposed using modern procurement theory and then adjusted to fit the company context. When forcing all purchasers to adhere to the new sourcing processes in the eSourcing platform a much better control and visibility over the purchasing department can be maintained. By choosing a sourcing approach within the platform the expectations is that the organisation will be more efficient, compliant and that the more thorough processes will reduce costs.

The eSourcing platform provided a fully integrated platform with the rest of the ERP used at Beta. This full suite solution has demanded significant resources and will continue to do so, the company will have centrally available experts to help purchasers with their sourcing processes and administrators that will help all of the master data to be clean. An important factor of this was that all purchasers are not conducting new sourcing events every week, but might only do this a few times a year. If it is mandatory to use the system and if that is integrated with other IT-systems there is a strong need making sure that the eSourcing program is maintained properly. The informant highlighted that the master data should be reserved for only people sufficient in the IT-systems to avoid errors and getting dirty data, i.e. incomplete or inconsistent data. Had a more stand-alone system been used the eSourcing platform would probably not need the same strict administration and handling, thus having less people employed to maintain the system.

Table 5.19. Utilised eSourcing disciplines.

eSourcing focus	Beta
Primarily sourcing process integration	x
Primarily increased supplier competition	

Configuration elements critical to eRA success

The informant at Beta had previously been in charge of a company that had implemented eSourcing with an eRA program. It was clear that even if Beta had only conducted a proof-of-concept with and not operationalised the eRA program yet, that most of the program and rules will follow her prior knowledge of implementing this before.

An important part of the eRA program at Beta was that eRA events should be an alternative to direct negotiations in the sourcing process. An eRA event should therefore have full buyer commitment with no post-auction bids, analysis or negotiations. This also is considered an ethical principle as suppliers will participate on equal terms and no nepotism can be utilised as all rules are displayed before the eRA.

In Table 5.20 the configuration elements of the governing structure in eRA events for Beta are shown and interesting to note is that Beta will only invite approved suppliers. Considering they did not experience large barriers in approving new suppliers this seems appropriate. Another ethical principle is that Beta will only use limited disclosure of supplier bids, this is in line with the research done by Carter et al. (2004).

The eRA program was not yet fully operationalised but Beta does have the foundation on what will be the governing structure with defined ethical guidelines and principles of how to handle suppliers during the events.

Table 5.20. Configuration elements of the governing structure in eRA events.

Principle, policy or guideline	Beta
Level of buyer commitment	Internal policy
Supplier participation principles	Only approved
Level of bid disclosure	Limited disclosure
Policies regarding bid disclosure	Internal policy
Defined ethical guidelines	Yes

Beta valued the supplier relationships highly and as seen in Table 5.21 different principles of handling suppliers depending on the strategic importance will be put up. In coherence with Arnold et al. (2005) Beta mentions an important factor as the perceived experience of the eRA, if the suppliers feel that the contract is put up to auction only to keep them at arm's length distance the partnership might sour.

Table 5.21. eRA utilisation and supplier relationship management.

SRM related eRA guidelines	Beta
eRA use principle based on SRM segments	Yes
SRM impact on eRA recurrence	Critical

Having a clean database and structured data protocols helps the digital sourcing processes and Beta did focus a lot on data infrastructure. In Table 5.22 configuration elements regarding the eRA data infrastructure at Beta is shown. The defined data infrastructure is built around the different modules in Beta's SAP Ariba platform, with eSourcing the strategic sourcing module has been mandatory for all purchasers to use and all sourcing data will be available there. The central eSourcing team has however taken an administrative role in the master-data management to keep all data clean and useful. This data infrastructure will enable purchasers to conduct proper supply market analysis and it will help top management to measure the performance of the eRA program.

Table 5.22. eRA data infrastructure

eRA data infrastructure	Beta
Defined data infrastructure/strategy	Yes
Data infrastructure defined with clear focus on eRA performance management	Yes
Deployment of eRA master-data management	Central

When creating eRA events they can be designed differently and the parameters Beta will use are shown in Table 5.23. The informant's answer on what auction types to use was very peculiar as she mentioned that auctions should be changed continuously as this would prevent suppliers from falling into a routine flow and make errors. But nowhere in literature could a source to support this statement be found. It does also seem counterintuitive that the suppliers would perform better in new settings than previously experienced settings.

When conducting eRAs the award criteria is always set to price only, as this will simplify the eRA and as Beta has set a governing principle to only have full buyer commitment the eRA the

contract will be allocated when the auction is over. Therefore simple rules are preferable for all participants. Beta still accepted that supplier bids could be valued differently and to be able to only use price as a main award criteria they had tried different versions of bonus-malus systems, e.g. in the initial auctions the incumbent supplier had been given a bonus the size of the switching costs in order to make the bids comparable. The event length or closing rule were not important to the informant when designing an eRA. When having redefined the sourcing process to incorporate eSourcing the pre auction had been given more emphasis in the auction process.

Table 5.23. Configuring the eRA design.

eRA design parameters	Beta
Auction type	Change continuously
Main award criterias	Price
eRA mechanism	Contract allocation
Event length	N/A
Closing rules	N/A
Pre vs. post auction balance weight	Pre auction

The preparations before any eRA event was very important and the most important part is the need for clear specifications, as seen in Table 5.24. The informant was not sufficiently aware of the different analysis that category managers performed at Beta, and did not wish to state what analysis should be made in the preparatory steps.

Without it Beta could not make comparable bids and if the suppliers are not comparable then the eRA sourcing approach should not have been chosen in the first place, which is consistent with the literature review that Pawar et al. (2017) performed. In the preparations Beta mentioned that all suppliers participating should be pre-qualified, which is consistent with their view on only inviting approved suppliers. This is also a process that Arnold et al. (2005) addresses, and they recommend using a RFQ round before the eRA.

Training both purchasers and suppliers was a large part of the informants job and this was an important part of using eSourcing altogether. If using new sourcing processes it is important that everybody understand how to operate and training is a big part of that (Beall et al., 2003).

Table 5.24. Preparing the eRA event.

eRA event preparations	Beta
Supply market analysis	N/A
Category analysis	N/A
Importance of clear specification	Very important
Pre-qualification of participants	Yes
Purchaser training	Yes
Supplier training	Yes

How to approach the supplier bid engagement was not clearly defined yet at Beta, as displayed in Table 5.25. But from previous knowledge of eRAs and limits that will be implemented at Beta are a minimum of three suppliers in any eRA event. A maximum limit of seven suppliers was determined primarily because adding more suppliers would not add any benefits to the eRA, but it would still be possible to add more. This is very consistent with the study performed by Millet et al. (2004) that reached the conclusion that three participants are the minimum and after the sixth participant the benefits of adding another supplier would only moderately increase.

Table 5.25. Configuration elements of supplier bid engagement

Improving supplier bid engagement	Beta
Supply market competitiveness	N/A
Contract minimum value	N/A
Contract max value	N/A
Bundling and lotting strategies	N/A
Minimum number of auction participants	3
Maximum number of auction participants	7

Beta had with the implementation of eSourcing redefined their whole sourcing process and eRAs was a part of this implementation. In Table 5.26 the eRA process integration at Beta is shown, but as it is not yet fully operationalised the internal best practices has not been able to optimise the eRA programs integration.

However, the eSourcing team responsible for the transformation into the new sourcing process has studied the best practices in the market and used this as a foundation for the new process. An emphasis on the analysis phase is present in order to ensure comparability between suppliers and fitness of sourcing approach before any eRA event.

Table 5.26. eRA process integration.

eRA process integration	Beta
eRA impact on sourcing process	Redefined
Sourcing process altered by internally developed best practices	Not yet
Sourcing process altered by identified external best practices	Yes
Extended analysis phase within sourcing projects to adhere to eRA fitness analysis	Yes

In Table 5.27 the eRA infrastructure integration at Beta is presented. The eRA program is being fully integrated with the rest of the purchasing organisation, available to use for any category that has the need for an eRA. A central eSourcing team will still be operational and conduct training for the purchasers that intend to use eRAs.

Beta does not have a central team to perform any analysis or ensure the applicability of eRAs, it is instead focused on giving the purchasers all the resources they can get to perform all tasks by themselves. This will require the category managers and other purchasers to learn new skills and the new system.

The eSourcing team is responsible for the central master-data management, but they will not integrate the IT-systems in the beginning because of fears that the ERP will ruin the clean data that is being created in the eSourcing platform.

Table 5.27. eRA infrastructure integration (system and organisation)

eRA infrastructure integration	Beta
eRA (organisation) infrastructure integration	Yes
eSourcing team facilitating organisational eRA training	Yes
Central analyst team ensuring eRA applicability	No
Central eRA team conducting all eRAs	No
Required category manager skills impacted by eRA utilisation	Yes
Emphasis on central master-data management	Yes
eSourcing and eRA data generation integrated with other IT systems	No

Several KPIs have been implemented to measure the performance of eRAs at Beta, in Table 5.28 these are displayed. The primary reason for implementing eSourcing was the expected cost reductions and Beta still wishes to understand the amount of realised savings from the

system. Having KPIs regarding the supplier conversion through the eRA event helps the understanding of supplier participation and can be an important part of helping suppliers perform better in the eRAs. Since the new system will be mandatory to use, having a KPI regarding the internal adoption rate of eRAs lets the top management understand how the purchasers have adopted different tools within the eSourcing platform. With this information they can direct and prioritise resources. The data infrastructure is considered critical for performance management to function, Beta understands this and the central eSourcing team has prioritised it.

Table 5.28. eRA performance management

eRA performance management	Beta
KPIs regarding realised savings from eRAs	Yes
KPIs regarding supplier eRA conversion	Yes
KPIs regarding internal eRA adoption	Yes
Data infrastructure considered critical for high level eRA performance management	Yes

5.3 Case Delta

Delta manufactures products in entrance automation and has an annual turnover of €2,13B. It is the global leader within its industry and has distributors in 90 countries. The products manufactured are ranging from automatic swing/slide/revolving doors, industrial doors, garage doors, hangar doors and docking solutions. It also produces gate and door automation solutions and sensors.The organisation is decentralised and divided into four different business segments with ten business areas.

5.3.1 Sourcing organisation and processes

The Delta sourcing organisation is very decentralised. On the very top level a Global Sourcing Director leads a team of six people centrally and then the rest of the individuals work at their respective business unit within the business area, roughly 80 FTEs across the organisation.

- *Category Manager*: In the central team Category Managers lead the strategies for the four categories: Electronics, Steel, Aluminium and Operators (i.e. door openers). They keep the strategies up to date and are maintaining a preferred supplier list for all buyers to use. Within their category they negotiate new recurring prices, oversee business reviews of current suppliers and scout for new suppliers.
- *Sourcing Manager*: At every business unit a Sourcing Manager is present to lead the team. This might mean that they lead a large multi-national team or only a handful of people at one site depending on the business unit size.
- *Strategic Buyer*: The Strategic buyer is a part of the team with more responsibility and often leads negotiations with suppliers. They report to the Sourcing Manager within the BU and form the local strategies of sourcing within their domain.
- *Operational Buyer*: The Operational Buyer works in the same team as the Strategic Buyer but has less responsibility over the purchasing strategies.

The organisation is focused on the direct sourcing, with only four persons working exclusively with indirect sourcing. It has a clear hierarchy of command but the mandate to choose and work with suppliers is decentralised down to the respective business units. It is only in the four categories electronics, steel, aluminium and operators that is decided upon in the central organisation. In the organisation no internal expert team exists but locally there are dedicated ‘Super users’ in the different business areas which are knowledgeable within the eSourcing platform and available for purchasers to ask if any help is needed.

The sourcing organisation classifies all their suppliers into five different relationships as described in Figure 5.6. All suppliers are fitted into this analytical model and the relationship is

largely dependent on the classification. All suppliers but the strategic partnerships are regularly exposed for market competition, and the aim is to challenge the strategic partnerships every third year regardless of performance in order to understand if they are keeping up with the market. With every three year period the strategic partnerships focused on creating value rather than exercising market competition. The approval of suppliers is a part of the supplier relationships and this process is very thorough, but it is not yet conducted with the help of eSourcing. The suppliers which are to be approved are found during supply market analysis and chosen by the purchasers in collaboration with other functions within the company.

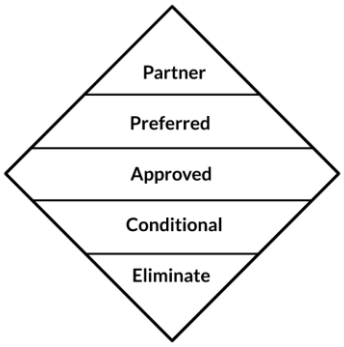

Figure 5.6. Delta's one-dimensional supplier classification model.

The direct material sourcing processes follow a predefined gateway structure, which ensures that all stakeholders have sign-off on their needs and it is authorised by the correct person depending on level of spend. This sourcing process is standardised throughout the organisation.

5.3.2 Maturity in eSourcing utilisation

The implementation of Delta's eSourcing platform was launched five years ago. They chose to use the system provided by Scanmarket and in the beginning the system only provided the capability of conducting eRAs. It was argued that eRAs added "an extra tool in the toolbox" during the sourcing process which Delta wanted to make available. The eSourcing platform has since mainly been used to perform reverse auctions but during the last year the module of sending eRFx has been added and implemented throughout the organisation. Delta is therefore viewed as mature in performing eRAs but very new to conducting eRFx events. The large majority of all sourcing events are still based outside the platform.

The platform is not mandatory for any sourcing process, but rather looked upon as a tool to help the sourcing process if helpful. The very decentralised organisation prevented the top management from making eSourcing mandatory, and they did not want it to be mandatory for all sourcing events to use eRAs. But in order to remove uncertainties and doubts regarding the phenomena of performing reverse auctions a KPI was introduced to all business units measuring the number or eRA events held. All business units were told that they needed to perform a small number of eRA events. The goal was to get people using the tool, but a KPI for savings or similar would not necessarily promote reverse auctions. In retrospect the implementation was effective but not perfect as a few eRA events were held without the knowledge needed and without the proper preparations necessary as people did not ask for enough help. These rough first events did not yield any savings but was argued to help ease the stigma and mystery behind the new tool. Some eRA events however were successful and the use is today widespread within the organisation with over a hundred auctions performed on a yearly basis.

The use of eRFx is still early in the implementation with around twenty events performed, no changes to the sourcing process has been done as an eRFx is regarded as fulfilling the same purpose as an RFx and the use is therefore completely optional. No other modules are added into the eSourcing platform currently but might very well be implemented in the future. Currently

the benefits behind using eRFx is argued to be the clear systematic approach as it is easier to manage documentation and being compliant with for example GDPR.

5.3.3 Important aspects of choosing sourcing approach

At Delta, no difference is seen between an RFx or an eRFx and the benefits from using a platform is not dependent on what type of goods or services that will be sourced but it is helping the systematic workflow in the process. Therefore no mandatory use of the platform has been forced.

The choice of sourcing approach is preceded by a market analysis, and the understanding of the market dynamics is important to use when choosing an approach. If there is only one supplier to choose from there is no need of doing an extensive RFQ, instead direct contact with the supplier should be initiated and the terms of cooperation negotiated. If there are multiple suppliers an RFQ should be used, and the choice between conducting the RFQ in an eSourcing platform or not is up to the purchaser handling the sourcing event. Currently the majority is done via email and that is thought to be because of old habits, the purchasers that have adopted the platform believe it is more efficient and easier to use.

The eRA however allows for a completely different sourcing approach and needs more careful consideration. The most important factor described was the comparability between suppliers bids, because if the bids are different by nature the product should not be put up for auction. On the opposite side, if the complexity is high and it is believed that the suppliers are different eRA would not be fitting. This would be analysed after sending out RFQ's and receiving the suppliers quotations, if the suppliers are comparable there is nothing to prevent and eRA to be used.

Occasionally Delta finds themselves locked-in to certain suppliers when customers require certain sub-suppliers to be used in the bill of materials. This creates an unwanted position where the supplier cannot be exposed to market competition and in these instances a direct negotiation with the supplier at hand will be followed. If the purchasers believe a locked-in suppliers' price is significantly higher than the market price strategies of communication with their sales and the customer exists. In similar fashion several product categories are bound to have suppliers which are certified by national or international standard (e.g. batteries). This does limit the competition as fewer suppliers will be available, i.e. only the certified are potential suppliers, but in general it helps to show which suppliers are available rather than limiting the purchaser.

5.3.4 Elements considered when configuring eRA processes

As explained the main reason for using eRAs at Delta was to expand the available tool set of negotiation practices. It is not intended to eliminate ordinary negotiations by email or F2F, but rather to be used when it is quicker or more efficient.

At Delta the number of suppliers invited to an eRA is always above three in order for competition to exist. On the other end no clear maximum exists, but less than ten would be advised as more preparations are needed for every added participant and the end result is unlikely to improve. The largest auction Delta has held included 15 suppliers, which was an auction for electrical batteries where most business units previously used different suppliers and this was an attempt to consolidate. It was a very rare occasion because all existing suppliers, and some new, were invited but the spend was very large which accounted for the extra work needed to be put in.

Then the product up for auction should be equivalent independent of the supplier, or as one of the interviewee put it "We need to compare apples with apples". In the auction no other

attribute than price is competed over and therefore all other attributes must be crystal clear, otherwise there exists a potential risk of letting the best bid in a TCO perspective lose.

At Delta only English reverse auctions have been used as it is the most simple and easy to understand. They knew other auction types existed but did not actively try them out, other types are available in the platform but none were used to their knowledge. The English reversed auction was however used in different set ups, either “full list” where the whole list goes to one supplier or a “list with cherry picking” where the best bids for each item is chosen. When only auctioning one article it is not different from auctioning a full list of articles and is considered the same. It is always communicated beforehand if there will be cherry picking or not after the auction. Delta choses the set up which makes the most sense, i.e. if there is no reason for it to be more efficient only using one supplier then cherry picking is used. An example of great use of cherry picking auctions in Delta is the freight of special products coming out of Atlanta in the U.S. These products require extra long and modified trucks, if something needs to be shipped Atlanta to Seattle then the shipper needs to have something to bring back to make the trip unless the price is going to be extremely high. Every month the team in Atlanta sends out next month's special freight in an auction for all dates and destinations and cherry picks the best prices for shipments after the auction is completed. These auctions were the smallest that Delta performed and was in the price range of approximately 15.000 SEK per lot.

Delta does not put up any buyer commitment when creating an auction. They communicate that they intend to follow the results and in the absolute majority of cases do, but the contract is not directly awarded to the best bid.

Some auctions are held only with suppliers that already have frame agreements put up, then the auction will use the frame agreement as a contract and the result of the auction as the price. This will reduce the amount of time put into negotiation after the auction. This type of auction is used for recurring events, e.g. the auction for the extra long trucks mentioned above, where all suppliers have signed frame agreements and the negotiation is done via an auction instead of having monthly negotiations with all suppliers. The best prices are cherry picked and used until next month’s eRA. This does not only save a lot of time, but it proves clear transparency for the suppliers and has been a very successful situation where all stakeholders have benefitted from the new eSourcing platform.

5.3.5 Within-case analysis

The Delta case was very interesting to analyse as the approach of implementing eSourcing seemed extremely relaxed. There were no forced changes into any sourcing processes and all purchasers in the company that wished to continue their old way of working were allowed to do so. Still they have managed to spread the use of it into the decentralised organisation.

Aspects of choosing sourcing approach

From theory the first aspect of choosing a sourcing approach is the benefit of sourcing digitalisation. When implementing eSourcing at Delta the decentralised organisation hindered the group initiators from making it mandatory and they had to convince the local purchasers to become users of the system. To persuade the purchasers focus was put on the benefits of eSourcing and as seen in Table 5.29 the expressed benefits were mainly the direct cost reductions but also the improvements of processes in both the cross-functional workflow and the overall time savings. Both of these benefits were described in theory, e.g. Schnellbächer et al. (2018), but Delta did not seem to experience all the benefits from sourcing digitalisation. This is probably because the overall sourcing process did not change considerably and even though the benefits were significant it did not revolutionise the overall sourcing performance.

Very interesting to note was that the main concern the top management expressed as important was that all purchasers tried the eSourcing platform at least once, and this was done by implementing a KPI for ‘number of events’ in the eSourcing platform. The outcome or

success was not measured, neither was the spend or total cost reduction by using the tools. The data from all events were probably still available and most certainly analysed but the top management relied on that the experience of using the platform would be enough to convince purchasers to use it. If they could unveil the mystery of this new tool people would start to use it and the most astounding result is probably that this strategy has worked. The platform is not adopted throughout the whole organisation yet and while the majority of sourcing events still take place outside the platform the user base is growing steadily, as is the number of sourcing events in the platform. This shows that even though Delta might not have experienced all the available benefits of sourcing digitalisation they still reap plenty of it and therefore the choice of using eSourcing sourcing approaches are growing.

Table 5.29. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Delta
Better data management	
Increased supplier invitations	
Direct cost reductions	x
Improved cross-functional workflow	x
Process time savings	x
Exploiting frontier technologies	

The second important aspect of using eSourcing found in theory was the analytical foundation of the company, with Delta's aspects shown in Table 5.30. As a decentralised company the purchasing was performed at every business unit with the analysis of each sourcing project done locally, and because of this no thorough investigation of exactly which analytical tools Delta used was conducted. But the data infrastructure to support all the purchasers in their work seemed to be sufficient and it is therefore believed that they should be in the position to use the eSourcing platform whenever possible. As a result of the decentralised structure very few purchasers worked at the group level and because of this the implementation of eSourcing might be slower and utilisation of the data gathered from digital sourcing processes might not be leveraged.

Table 5.30. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Delta
Organisational structure in purchasing	Decentralised
Central sourcing analyst team	
Central category management team	
Internal eSourcing consultant team	
Data infrastructure	Sufficient

The third aspect of choosing a sourcing approach are the barriers which prevent a purchaser from conducting competitive supply market exercises, with Delta's highlighted barriers in Table 5.31. Delta manufactures products where they usually own the full bill of material and therefore are enabled to choose suppliers by themselves. But in some cases they are forced by their customer to use certain sub-suppliers which they then have to comply with. By being able to choose any supplier the sourcing approaches would tend to start with competitive approaches such as eRFx and RFx with multiple suppliers. They do experience a few categories with supplier certifications requirements, and even though it is a clear barrier it was seen as a small.

The lack of supply market analysis is the endless struggle of finding all potential suppliers, which was experienced by Delta. This is one of the main tasks of a purchaser's work to conduct and solve in order for not being locked-in with one supplier. If being stuck with only one approved supplier the purchasers were encouraged to approve new suppliers, and this process was described as both lengthy and difficult posing a real barrier in the purchasers work.

Combine this with high switching costs and most would be satisfied to keep the old supplier, but when approving new suppliers the additional market leverage will most certainly often pay off.

Table 5.31. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Delta
Downstream bill of materials	x
Supplier certification requirements	x
Lack of supply market analysis	x
Difficult supplier approval processes	x
Geographically bound supplier base	
High switching costs	x
Proprietary technology, patent positions	

The reason for the relaxed view on eSourcing implementation to be so outstanding is that it does not actively try to mitigate the internal resistance as described by Schoenherr (2019, p. 23). Delta relied heavily on the notion that eSourcing would speak for itself, convincing purchasers to start using it after having tried it out once. They still did have centrally facilitated training and they did keep track over the success of the events conducted in the eSourcing platform and used it to convince and persuade purchasers to use it, even if not forcing a purchaser to change their work into digital sourcing processes.

A method to enable the organisation to use eSourcing more efficiently was the appointing of super users that could help people on a local level, the idea being that they would be more confident in using the eSourcing platform if they could get expert help. In Table 5.32 all methods deployed by Delta for mitigating internal resistance is shown.

Table 5.32. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Delta
Dedicated eSourcing team	
Centrally facilitated training	x
eSourcing performance management	x
Master-data management	
Internal consultants or super users	x

The last aspect of choosing sourcing approach was not directly seen in literature. When interviewing and discussing with the informants at Delta it was clear that their intentions of utilising eSourcing was not to rearrange the current sourcing processes in order for them to be more efficient. The main idea was to “unlock a new tool in the toolbox”. When choosing a sourcing approach there are not any incentives to use eSourcing if it does not help the single sourcing event to be more competitive and to leverage the market into finding a reduced price. This discipline of utilising eSourcing is shown in Table 5.33 and is very interesting as it does only help the purchaser in the supplier selection process. In the future when the eSoucing platform matures it is believed that Delta will further try to incorporate eSourcing into the sourcing processes. This would help transferring more sourcing events into the platform, making it possible to analyse and measure the performance of the sourcing organisation more carefully than currently.

This implementation did seem very fitting for the organisation that Delta has, they are very decentralised and the idea of letting each business unit adopt the eSourcing platform on their terms and use it for their individual needs fits this more relaxed implementation. If the central organisation would force the system onto all sourcing processes a very large risk of conflict would be posed since the different units have different methods of sourcing and a one uniform solution would probably not be applicable.

Table 5.33. Utilised eSourcing disciplines.

eSourcing focus	Delta
Primarily sourcing process integration	
Primarily increased supplier competition	x

By letting people try the tool in Delta they managed to get a very positive attitude towards the platform which probably has influenced the adoption of eSourcing. It was understood that Delta did see eSourcing as a substitute to the ordinary sourcing processes and not something that could revolutionise it. Therefore sourcing events which would be categorised under 'No RFx' would probably continue to be done in the traditional sourcing process via direct contact with the involved suppliers. However normal RFx sourcing events will without doubt be exclusively used in the eSourcing platform looking forward into the future.

Configuration elements critical to eRA success

The eRA program at Delta was the most extensive in the whole study. Its use was widespread, both for single sourcing events for procurement of new goods and services but also in recurrent situations with monthly eRAs to determine next month's prices. The relaxed approach has encouraged users to try it out and adjust it for their specific needs.

The auction governance within Delta was built on trust rather than strict policies and the guidelines that have been made seemed to have worked. In Table 5.34 the configuration elements of Delta's governing structure is presented.

Delta did not put up a full legal buyer commitment before any of their auctions, instead they informed all suppliers coming into an eRA of the expected buyer commitment. By doing so two things are important to note. The first is that Delta must consistently be very clear with their intentions in order to maintain their good supplier relationships and not damage it in any way as mentioned by Beall et al (2003), and this seems to work very well at Delta. The other thing to note is that the process balance actually can be shifted to conduct post-auction analysis. If the auction has a full buyer commitment then the outcome of the auction will be determined directly, but without full buyer commitment this creates leeway for the purchaser to analyse the bids post-auction and then choose the best bid.

In agreement to Jap (2007) the bid disclosure is limited and this was the standard setting at all eRAs performed. The same argument used by Jap (2007) was reflected by Delta in that the limited bid disclosure was used to protect the suppliers from other suppliers gaining market data from their bids.

The combined actions and policies of governing eRA events were seen as having sound ethical guidelines in place. Ensuring that the purchasers will not exploit any of the suppliers in an eRA event.

Table 5.34. Configuration elements of the governing structure in eRA events.

Principle, policy or guideline	Delta
Level of buyer commitment	Internal policy
Supplier participation principles	Only approved
Level of bid disclosure	Limited disclosure
Policies regarding bid disclosure	Internal policy
Defined ethical guidelines	Yes

The governing structure was seen very closely related to supplier relationship management. For example the supplier participation principle of only inviting approved suppliers is not only affecting the ease of conducting the auction (as the comparability becomes easier when all

suppliers are approved) but it also gives the other suppliers a more serious impression when conducting the eRA. Adding to that Delta has principles of when to expose strategic partnerships for competition and when not to, noted in Table 5.35. All of this was done as Delta saw SRM's impact as critical to the success of the eRA program and having recurring events.

Table 5.35. eRA utilisation and supplier relationship management.

SRM related eRA guidelines	Delta
eRA use principle based on SRM segments	Yes
SRM impact on eRA recurrence	Critical

The data infrastructure was found to be an important configuration element of an eRA program, in Table 5.36 the aspects of Delta's eRA data infrastructure are shown. At Delta it was only understood that local super users helped to create eRA events. But which data that they gathered and used was not clear, and this is probably an effect of the less strict approach on using eSourcing where the main idea has been to utilise eRA as an alternative to negotiations for selecting suppliers and not to change the process. These super users will probably become extremely important for the purchasing organisation as the eRA program matures and Delta looks to further improve the success of eRAs.

Table 5.36. eRA data infrastructure

eRA data infrastructure	Delta
Defined data infrastructure/strategy	N/A
Data infrastructure defined with clear focus on eRA performance management	N/A
Deployment of eRA master-data management	Local super users

It was clear that Delta tried to simplify the use of eRAs and therefore the standard designs were implemented as seen in Table 5.37. With the english reverse auction type both purchasers and suppliers have a natural understanding of the rules. This helps purchasers to try it out without being too unsure of the results. The same goes for having only price as the main award criteria, multiple variable award criterias might capture more more perspectives in an auction but is not as easy to understand as the only price focused auction.

Because of Delta not having a full buyer commitment the eRA mechanism will be of a price discovery nature, where the eRA will reveal the market price and then the purchaser can choose the best bid. It could be argued that suppliers do not put in their best bids since the contract will not be allocated in the auction, but no such tendencies were expressed by Delta.

Table 5.37. Configuring the eRA design.

eRA design parameters	Delta
Auction type	English
Main award criterias	Price
eRA mechanism	Price discovery
Event length	N/A
Closing rules	N/A
Pre vs. post auction balance weight	Unchanged

In Table 5.38 the expressed importance of preparing an eRA event is clearly demonstrated by Delta. To highlight the most important part of the preparations the specifications are marked as very important as this will help the comparability between bids. This was not by any means a surprise as all articles in the literature review regarding eRAs described clear specifications as an important part of the eRA event (Emiliani, 2000; Smeltzer & Carr, 2003; Beall et al., 2003; Carter et al., 2004; Wagner & Schwab, 2004; Arnold et al., 2005; Elmaghraby, 2007; Amelinckx et al., 2008; Pawar et al., 2017).

Table 5.38. Preparing the eRA event.

eRA event preparations	Delta
Supply market analysis	Yes
Category analysis	Yes
Importance of clear specification	Very important
Pre-qualification of participants	Yes
Purchaser training	Yes
Supplier training	Yes

When configuring an auction Delta did not use any additional bundling strategies different from what they would traditionally do and the minimum contract value for a single lot was a staggering low 15.000 SEK, stated in Table 5.39. This is very much put in contrast to theory as the lowest auction size found in literature was $150.000 (Schoenherr, 2019, p. 90). When discussing this with the informant it was understood that the benefit from those small auctions was not in the price reductions but instead in the process efficiency of the contract allocation using the eRA. Max values were never interesting to discuss as a bigger auction size brings higher supplier bid engagement. The number of suppliers that Delta invites to eRAs was consistent with Millet et al. (2004) as the minimum was three suppliers and the maximum was a vague 7-9 suppliers, with diminishing benefits as more suppliers were invited.

Table 5.39. Configuration elements of supplier bid engagement

Improving supplier bid engagement	Delta
Supply market competitiveness	N/A
Contract minimum value	15.000 SEK
Contract max value	No max
Bundling and lotting strategies	No
Minimum number of auction participants	3
Maximum number of auction participants	7-9

Delta did not implement eRAs as means of changing the sourcing process, it was the expansion of opportunities for the purchasers to leverage market competition. Therefore the sourcing process was not altered by identifying best practices as seen in Table 5.40. But in certain categories the use of eRAs proved very helpful, especially for simple recurring negotiations where the contract could be up for an auction instead of doing monthly RFQs and choosing the best bid. Therefore the eRA has only had a partial impact on the sourcing process as it has mainly been developed in areas where a need for it has been discovered.

Table 5.40. eRA process integration.

eRA process integration	Delta
eRA impact on sourcing process	Partial
Sourcing process altered by internally developed best practices	Yes
Sourcing process altered by identified external best practices	No
Extended analysis phase within sourcing projects to adhere to eRA fitness analysis	No

As the process did not change significantly it is not hard to imagine that the organisational infrastructure did not change either, seen in Table 5.41. The only change is that a small team has received the responsibility to maintain the system and train new purchasers in using it.

Table 5.41. eRA infrastructure integration (system and organisation)

eRA infrastructure integration	Delta
eRA (organisation) infrastructure integration	No
eSourcing team facilitating organisational eRA training	Yes
Central analyst team ensuring eRA applicability	No
Central eRA team conducting all eRAs	No
Required category manager skills impacted by eRA utilisation	No
Emphasis on central master-data management	No
eSourcing and eRA data generation integrated with other IT systems	No

Delta did not have a strict implementation plan of the eSourcing initiative but they did measure the success as realised savings. This is not only very useful in persuading local purchasers into using the system but also to build a business case for the top management that the costs of having an eSourcing platform are justified. In addition to that they did keep track of the adoption rate within the company, mainly to gain an understanding of the users in the platform. The performance management was not focusing on strategic goals nor was the data infrastructure in place for doing so, and in this early phase of still implementing an eRA program the adoption rate might be a good KPI. But Delta did recognise that they need better measurements in order to manage performance of the eRA program and the users in the system. Table 5.42 displays the eRA performance management at Delta.

Table 5.42. eRA performance management

eRA performance management	Delta
KPIs regarding realised savings from eRAs	Yes
KPIs regarding supplier eRA conversion	N/A
KPIs regarding internal eRA adoption	Yes
Data infrastructure considered critical for high level eRA performance management	Yes

6 External cross-case analysis

This chapter combines all the case reports and draws insights from these through cross-case analysis. It is structured with two separate sections in accordance with the two research questions.

6.1 Aspects of choosing sourcing approach

The case companies confirmed and elaborated on all four aspects of choosing sourcing approaches found in theory. In addition to that a fifth aspect was found and it was found through the insight of the companies' intention of implementing eSourcing. If they were aiming for process integration or if they only wanted the tools for creating additional supply market competition. The sections are divided into each of these five aspects, with a general decision model for choosing sourcing approach proposed.

The decision model is founded in the starting question if a product category can be subject to a competitive supply market exercise shown in Figure 6.1. If it can, then the three sourcing approaches of RFx, eRFx and eRA exist where multiple suppliers compete for the contract. If not then the purchasing organisation either willingly or unwillingly has to conduct direct negotiations with a single supplier (called 'No RFx' in the introduction). By cross-analysing the case companies patterns are found and the model is described, a focus on the difference between eSourcing and traditional sourcing is natural to discuss and will be shown to be important. Especially the enablers and barriers of using eSourcing in general with all its features as well as the specific requirements of conducting an eRA event.

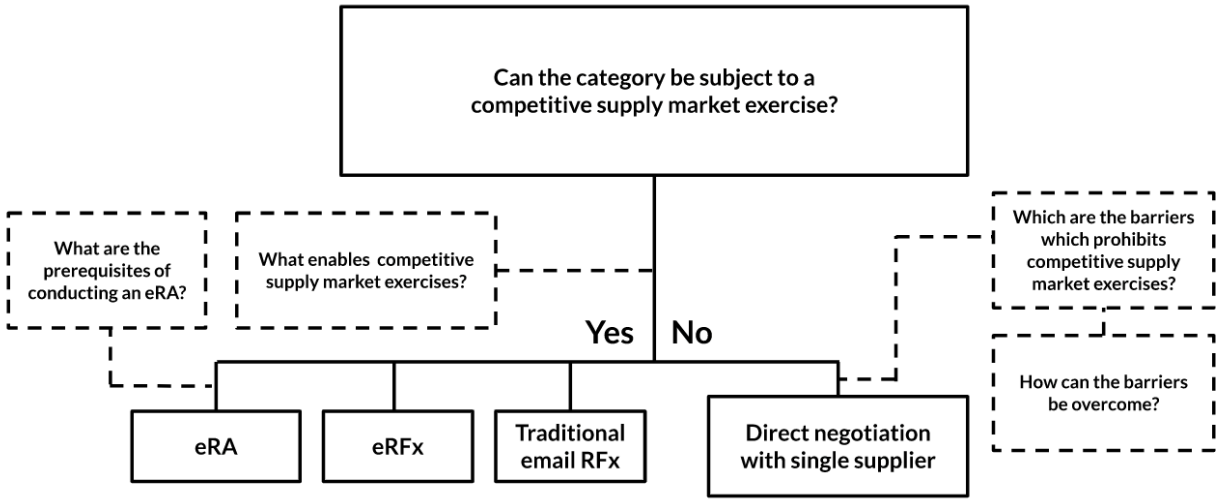

Figure 6.1. How implementing eSourcing affects the mix of available sourcing approaches.

6.1.1 Benefits of sourcing digitalisation

As expected from theory all companies within the study had experienced improvements by implementing eSourcing, although the types of benefits varied between the different cases. The combined benefits of conducting a sourcing process through an eSourcing platform rather than traditional sourcing had eradicated the need for sending RFx in the traditional sourcing process. All companies expressed that an eRFx event using an eSourcing platform would always be preferred to a traditional RFx event because of the lack of downside and the abundance of upsides. The expected benefits from theory and the experienced benefits from the case companies are displayed in Table 6.1. A company probably appreciates several benefits without knowing or communicating it during the interviews, and the crossed fields in the table are the clearly expressed benefits by the informants in their view of the case companies.

Table 6.1. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Better data management	x	x	x			x
Increased supplier invitations					x	
Direct cost reductions	x	x		x	x	
Improved cross-functional workflow	x	x	x	x		
Process time savings	x	x	x	x	x	
Exploiting frontier technologies						

Four companies expressed their data management to have improved using eSourcing. Their purchasers now work more efficiently as all the data needed is readily available. Furthermore their management has attained a lot better transparency within the process, enabling to align KPIs more precisely to the sourcing strategies in place. The better data management was for example made available through contract management modules and these helped purchasers to analyse all current active contracts and use this data to renegotiate expensive contracts. In both cases Gamma and Zeta the companies seemed to value the add-in modules such as 'supplier management' and 'contract management' very highly, and having these modules in place helps use the platform and choosing eSourcing sourcing approaches before traditional approaches since they are confident in using the system. Case Alpha and Beta also expressed the better data management that eSourcing proposed but did not put emphasis on certain modules but instead they emphasised that general data made available of using eSourcing is much easier to analyse and creates better analysis, therefore preferring eSourcing before traditional sourcing.

Epsilon stood out in expressing the availability of inviting more suppliers using the eSourcing platform. This benefit was described due to the ease of process control with a monitoring overview of the invited suppliers, enabling them to follow all of the additional suppliers within the sourcing event. The other case companies did not seem limited in sending out traditional RFxs to all of their suppliers in a sourcing project but Epsilon had access to more suppliers than they could efficiently manage in certain categories. This is believed to derive from the nature of the industry that Epsilon operates in as the food industry has strong governing bodies and all suppliers that are certified by the national Food and Drug Administration are inherently qualified. The other companies and their respective industries do not operate in this way and it can be very time consuming to find new suppliers that are qualified. The same benefit was also found in the literature review by IBX Group (2009) seen as the widening of the sourcing funnel enabling the cooperation with more suppliers. Highly commoditised product categories could however have plenty suppliers in any industry and this benefit, while not expressed by the other companies, might still exist for all.

When acquiring an eSourcing platform it is executed with a business case in mind, believing the company will have a positive impact on profits with it. Especially through using eRA as the price focus is very tangible but also in eRFx as the ease of adding additional suppliers will increase market competition and help negotiations. But only four of the case companies explicitly said that eSourcing reduces direct costs and Beta was very careful to point out that the price reductions should not be overestimated. The analogy is that if true market competition already exists then the price reductions would not materialise by adding additional market competition. However since true market competition rarely exists eSourcing does help leverage the market competition in the areas where any supplier has appreciated large margins over time and this is where the price reductions are found. But expecting to continuously drive down prices based on supply market competition will not be sustainable. The term "First Strike Auction" by Smart and Harrison (2004) was coined in literature expressing that after the first auction the market price has been found and additional price reductions would not be realised. Those price reductions might still be very significant and should not be dismissed as both Delta

and Epsilon expressed that this was their main benefit from eSourcing and both had been very successful and satisfied in their implementation.

The main benefit expressed by both Alpha and Beta was the process efficiency that digitalisation brought. But as ‘process efficiency’ is loosely defined the analysis found two aspects of this benefit; the improved cross-functional workflow and the process time savings. This is due to the fact that eSourcing platforms help the purchaser to be more in control in the cross-functional workflow and be more efficient with communication which in turn delivers significant time savings.

Both Alpha and Beta provided clear cases for the improved cross-functional workflow when they implemented eSourcing. They saw an opportunity in refining the sourcing process as the data becomes more accessible and communication with different stakeholders easier when the eRFx and eRA events were held in the eSourcing platform. By doing this other departments got a better understanding of the process and if suppliers had any questions they could be answered directly by the responsible stakeholder rather than the purchaser being a middleman in communication. This was found to be consistent with literature as Schoenherr (2019, p.15) also describes the communication and process benefits that digital sourcing processes bring.

The benefit of process time savings was mostly accounted to the reduction of slack time in the process. Because of the ability to monitor all suppliers the communication could be directed to laggards and because all stakeholders were invited into the same events the communication pathways were shortened. Epsilon explained that with the extra time saved additional eRFx events could be held and apply market competition on more categories to reduce cost even further. With most companies expressing time savings and with the research by Schoenherr (2019, p.16) stating that eSourcing generates time savings it was seen as an important benefit in the sourcing process.

The sophisticated frontier of digital sourcing today exploits technologies such as AI, RPA and machine learning as advocated by the top management consulting firms such as McKinsey & Co and Boston Consulting Group (Jain & Woodcock, 2017; Högel et al., 2018). But these technologies were not used by any of the case companies, indicating that manufacturing companies are lagging in digitalisation. It also suggests that eSourcing can be implemented without the use of these technologies and that there are further benefits to be reaped than the ones found in this study in the future if a company starts developing an advanced digital purchasing function.

Analysing the differences between companies it is interesting to observe that Zeta does not only experience the least benefits of using eSourcing but they also have utilised eSourcing the least. It is believed that the construction industry did not pose the same benefits of eSourcing as the manufacturing industry and therefore Zeta, even though the most mature company of the six regarding eSourcing, used eSourcing to a lesser extent. However, with only one company from the construction industry it might be too little information to draw such large conclusions.

6.1.2 Analysis practices and data infrastructure

Both the structures, scopes and types of strategic sourcing analyses has been highlighted as important in the study in regards to making informed decisions of what might be the optimal choice of sourcing approach. In fact the scope, infrastructure and models of sourcing analysis is often not only what determines when, but if, a company decides to go to market to challenge existing supplier structures. In Table 6.2 the case companies general structures for conducting analysis in sourcing events are presented.

Table 6.2. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Organisational structure in purchasing	Center-led hybrid	Centralised	Centre-led hybrid	Decentralised	Decentralised	Centre-led hybrid
Central sourcing analyst team	x					x
Central category management team	x	x	x			x
Internal eSourcing consultant team	x	x			x	x
Data infrastructure	Sufficient	Sufficient	Sometimes bottleneck	Sufficient	Sufficient	Sufficient

The organisational structure and scope of analysis, e.g. if the analyses are conducted by a centrally facilitated analyst team or by central category managers, typically mitigate that choices regarding sourcing approaches are done on an ad-hoc basis. When the sourcing project analysis is conducted centrally, there are usually increased possibilities and mandates to aggregate volumes to increase the leverage and scope in the sourcing project. Although contract value is not highlighted as significant for eRA success by any of the case companies, the need for eRA preparations is. If the leverage and scope of the sourcing project would increase, it might thus be a catalyst for making it worth to actually go the extra length of preparing an eRA as opposed to only conducting eRFx.

The existence of an internal eSourcing consultant team which is responsible for implementing and transforming the eSourcing agenda as well as facilitating help-desk function and training sessions has proven to have a big effect on the adoption of eSourcing based sourcing approaches. Deploying a combination of such roles of course requires either a certain critical mass or a high level of centralisation in order to make sense from a cost versus value perspective. However, all of the case participants can be considered to be big enough to be able to facilitate a combination of all such roles. Due to some case companies being decentralised, it might still not have made sense from an organisational perspective.

The data infrastructure from which data is mined for the strategic sourcing analysis can be a bottleneck for making information decisions regarding which sourcing approaches to use in a decentralised organisation, according to theory. The notion is that companies with higher levels of centralisation tend to have more suitable infrastructures to conduct more detailed strategic sourcing analyses, both organisation and IT structure wise. Most case companies, did however argue that they have the adequate data infrastructures to be able to choose sourcing approaches appropriately. It should be noted, as highlighted by Beta, that once the eSourcing platform is being fully utilised, it becomes a critical component in extending the data infrastructure. An eSourcing platform, in combination with well maintained master-data management practices, will start to generate valuable data regarding both the category structure as well as the corresponding supplier bases (including non-utilised suppliers).

Furthermore the analytical tools and models upon which spend, category structures, supplier bases, supplier relationships and supply market characteristics are analysed are argued to be critical for the choice of sourcing approach by most case informants. As an example, Alpha stated that they conduct Kraljic segmentation per the current supplier base to get an overview of the characteristics of all existing supplier relationships. But in regards to developing sourcing strategies within sourcing projects, especially for their strategic sourcing projects when specifications and supplier base is unknown, they instead emphasised Kraljic segmentation per sourcing category in combination with Porter's five forces. Their emphasis on these analysis practices for competitive sourcing projects was motivated by its focus on supply market analysis to improve the capability to identify viable alternatives to current supplier and specification structures. When using analytical models focusing only on the current supplier base and SRM rather than supply market competition, there is a risk that the non-utilised supply market potential is overseen. If balance is not achieved in how and which sourcing

related analyses are conducted, a company can e.g. become too reliant on non-challenged strategic partnerships or conversely be too focused solely on price related attributes.

Two analytical parameters were highlighted as critical prerequisites for the choice of sourcing approach, especially for eRA applicability. These were the ease of achieving comparability between supplier bids among non-price attributes, as well as the amount of mutually competitive suppliers. The ease of achieving supplier bid comparability is typically related to the specification complexity. Meanwhile, the number of competitive suppliers is typically related to the level of supply market analysis being conducted as well as the complexity of approving and certifying suppliers. In regards to the analytical practices and how they might affect the choice of sourcing approach, it was thus very interesting that none of the case companies would mention any analytical model or framework being used to help develop sourcing strategies based on those critical parameters. Consequently a developed framework is presented in Figure 6.2. The framework is based upon the defined sourcing approaches of this study as well as the two critical parameters and their impact on the choice of suitable sourcing approach.

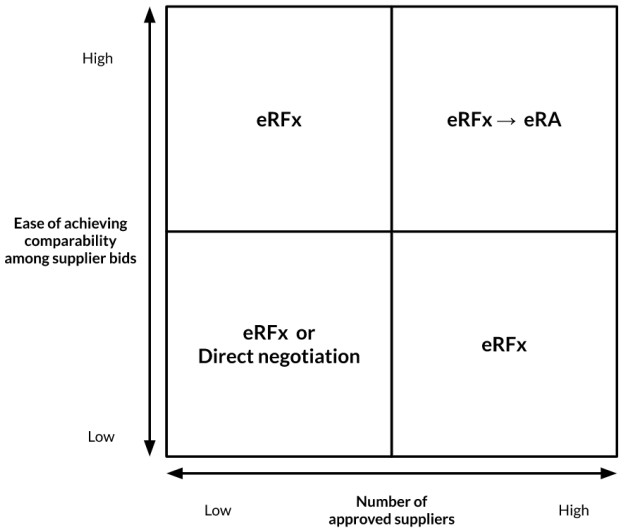

Figure 6.2. Choosing sourcing approach based on comparability and number of suppliers

Note that all case companies similarly implied that the lower limit in number of approved suppliers for when eRAs could be conducted was three, whereas no such number exists for eRFx. In regards to the need for achieving bid comparability, its requirement is nothing new when comparing to RFQ events. However, in an eRA the bidding process is so compressed in time that when the auction is finished, there needs to be an idea of how the winning bid will perform on the non-price attributes. In regards to achieving such bid comparability, most case companies suggested that a combination of thought-through specification management and eRFQ events should occur prior to every eRA event as the efficient solution.

6.1.3 Barriers for competitive supply market exercises

As highlighted in theory by Gelderman & van Weele (2003), the main reason for when competitive market exercises are not done are situations of supplier lock-in, typically from certification requirements or patent positions. Their research was well in line with how most of the case companies' in this study described when eRFx and eRA were conducted and what the most common barriers to such competitive supply market exercises are. The barriers are summed up in Table 6.3 and analysed below.

Table 6.3. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Downstream bill of materials	x		x	x		x
Supplier certification requirements	x	x	x	x	x	
Lack of supply market analysis	x	x	x	x	x	x
Difficult supplier approval processes	x			x		
Geographically bound supplier base						x
High switching costs	x	x	x	x	x	
Proprietary technology, patent positions						

Alpha, which is highly exposed to automotive and aerospace industry segments, stood out in their strong emphasis on the competition bottleneck from supplier approval processes and supplier lock-in situations due to downstream bills of materials. Meanwhile, Beta stood out in how well they had adopted company-wide supplier certification procedures which functioned on the same principles of process efficiency as their contract management. This quick adoption had been the case due to supplier certification at Beta had been quite a bottleneck for competitive supply market exercises previously.

All cases expressed the importance of supply market analysis, and if not conducted properly the sourcing event would neither be competitive or successful. During the analysis the supply market has to be searched and in this phase all potential suppliers are found. If not doing this properly potential suppliers can be overlooked and the purchaser handling the situation inappropriately, e.g. if the purchaser is left believing that the incumbent supplier has a monopoly they might treat them very differently than in a competitive market.

But knowing that there exists other suppliers does not help the purchaser if the approval process is difficult and lengthy. Both Alpha and Delta experienced meticulous approval processes and the purchasers had to wait until they were finished before they could put market leverage on the incumbent supplier through sourcing events with multiple suppliers.

Zeta experienced a strong barrier of conducting competitive supply market exercises in certain categories where the suppliers were geographically bound to one region. These categories were all service based, e.g. electrical installations, and because these suppliers often were small companies or even one person companies they only operated on limited geographical areas. This was regarded as an attribute to the construction industry and the transferability limited to the manufacturing industry, but in unique categories as MRO similar attributes of geographically bound suppliers can be shared.

All companies showed tendencies of single sourcing in certain categories. In some cases the purchasing spend was too low to challenge the supplier structure, in other it was different kinds of supplier lock-in which steered the sourcing professional's actions towards direct negotiations with single suppliers. For all cases, there were categories with high switching costs. Although, switching costs were emphasised as a bottleneck for competitive supply market exercises especially within the manufacturing industry. Zeta in the construction industry, emphasised the barrier posed by several other factors substantially more than supplier switching costs.

In none of the cases studied proprietary technology or patent positions from suppliers were common as barriers for conducting competitive supply market exercises. But this is not seen as this barrier does not exist, but merely as the cases studied were not experiencing such relationships. If any supplier does have a patent position and is locked-in it is believed to be similar as if they were the only approved supplier.

After analysing the mix of highlighted barriers, it could be concluded that they all correlated to the possibility of extending the supplier base as a result of fruitful supply market analysis. In other words, the more barriers a company would be exposed to - the harder it would be to

extend the supplier base. However, it could simultaneously be argued that those are the situations when supply market analysis will prove even more valuable. The key takeaways from analysing this set of barriers are thus that iterative supply market analysis is critical if the goal with eSourcing is to increase the scope and frequency of when the sourcing approaches eRFx, and especially eRAs, are likely to be successful. Although it is one of the oldest clichés of purchasing literature, it needs to be emphasised that such supply market analysis should be done on the basis of the purchasing specification rather than by the goal of simply replacing a supplier solely from a price perspective. The value of finding substitutes or altering the specification based on supplier's expertise is often overlooked as one of the best ways to improve cost efficiency in purchasing. Porter's Five Forces supply market analysis is a classic in this regard, since it explores both alternatives for substitutions, general external insights about the supply market as well as the relative power balance between suppliers and the buying company.

All companies to some extent had beneficial strategic partnerships in place for certain categories on the basis of mutually beneficial strategic value creation. Although that per se did not imply that the companies would never challenge their supplier's price levels, it would mean that the focus in the supplier relationship was on value creation rather than exposing the strategic partner to iterative market competition. For Alpha, this was the case with steel components, a highly strategic category within the company. For this reason, there was both a need to maintain a broad supplier base and keeping supplier relationships tight. Due to the strategic importance of quality and delivery in the category as well as cost due to its high spend, a balance between cost efficiency and strategic partnership needs to be attained. In the strive for such balance, Delta even defined the ambition to challenge strategic partnerships no more or less than once every third year.

Another barrier only regarding the applicability of eRA events is that it had three different prerequisites that all needed to be fulfilled. This was put forward from IBX Group (2009) and confirmed by all informants from the cases using or planning to use eRAs. To satisfy the prerequisites all case companies had a process of first conducting eRFx prior to the eRA event and in the eRFx event confirm that the three prerequisites are all fulfilled. These were:

1. Minimum of three suppliers participating in the eRA, all of which should be approved and qualified to be assigned the winning contract.
2. The specification must be clear enough so that all suppliers' bids are comparable.
3. Only perform eRA events which do not risk hurting strategic partnerships.

In regards to when F2F discussions and direct negotiations were especially desirable, it was highlighted mainly as a powerful approach to draw upon the category specific capabilities of the supplier e.g. when specifications were extraordinarily complex. F2F discussions and negotiations were also argued to be a good way of tightly managing valuable supplier relationships.

6.1.4 Achieving organisational eSourcing compliance

From the literature review Schoenherr (2019, p. 21) put forward six different organisational barriers for implementation of eSourcing. From the case studies only one of these were expressed, but all the companies had experienced it and applied different strategies to mitigate it. The sole barrier was the 'internal resistance' for adopting eSourcing, which was not any active resistance or pushback from purchasers but more often a lack of interest to adopt and use it. Even though the benefits, as previously described, was plentiful the purchasers seemed to stick with old habits. The purchasers that kept only the traditional sourcing approaches would be in a position of less options and run the risk of choosing a sub-optimal sourcing approach. Different methods of achieving organisational eSourcing compliance were used to overcome this barrier of internal resistance and those are displayed in Table 6.4.

Table 6.4. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Dedicated eSourcing team	x	x				x
Centrally facilitated training	x	x	x	x	x	x
eSourcing performance management	x	x		x		
Master-data management		x				x
Internal consultants or super users	x	x		x	x	

The companies committed different amounts of resources in their transformation program. In the two cases of Alpha and Beta a centrally managed transformation team had been appointed to integrate the sourcing process into the eSourcing platform and the decision of making all eRFx sourcing events through the platform was made by the top management. This heavy investment did eliminate the internal resistance from using eSourcing as the option of sticking with traditional sourcing processes was cancelled. However, both Alpha and Beta did employ additional strategies to help implement eSourcing. Otherwise an active resistance could have been expressed. The Zeta also had a dedicated team for eSourcing but it was understood that their primary focus was not in the source-to-contract process but rather in the procure-to-pay. A fully integrated sourcing process was therefore not available at Zeta even though plenty of resources were put into the use of the platform.

In the other companies responsible people for eSourcing implementation also existed, but these also had other work tasks alongside this responsibility. In these companies the implementation was slower and lingered on. An important perspective is that both Alpha and Beta had centrally managed purchasing organisations while the other companies had more decentralised structures. The belief is that a centrally governed organisation more easily could make the decision to summon the necessary resources to assemble a transformation team, in contrast the branches of a decentralised organisation might have trouble observing the benefits eSourcing brings and not be eager to appoint a central transformation team.

All of the companies however did conduct training for the eSourcing platform. This is an easy way to market the solution and show all the benefits that eSourcing brings. In these training success stories were told to further bolster the use of eSourcing and deter any resistance. After an initial training session the companies did differ.

One tactic used by Gamma was to let purchasers begin to use the platform after the initial training and then hold additional refresh training to let all purchaser experience and grow in the role of using eSourcing. After the third training session with all purchasers Gamma has made it mandatory that all contracts should be created within the eSourcing platform and therefore adding pressure on the purchasers to conduct eRFx in order to save time in the contract management.

Delta instead appointed at minimum one super user in all of their separate business areas and these super users became both advocates for eSourcing but also mentors and helpers for other purchasers.

In the cases of Alpha, Beta and Delta they all used KPIs to measure the eSourcing performance. By understanding the usage and performance of eSourcing the correct actions could be performed to implement it more efficiently, directing resources to the laggards and highlighting success stories.

All of these tactics were different means of reaching the same goal: getting the purchasers to try out the eSourcing platform and experiencing the benefits. Training alone was not sufficient at any company and it seemed as if having internal consultants or super users to help gave the best effect of spreading the eSourcing use. Being an expert and a person that can both show the objective benefits of eSourcing but also having empathy and understanding the individual

persons needs. That being said, the efficiency of the different approaches is of course highly contextual and if successful at one company that does not imply that it is successful at another.

6.1.5 Process integration versus supply market competition

This final aspect was identified from the case companies different motives in using eSourcing. A first observation of the case companies' various views of eSourcing was that they broadly correlated to one of the two following disciplines as seen in Table 6.5.

Table 6.5. Utilised eSourcing disciplines.

eSourcing focus	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Primarily sourcing process integration	x	x	x			x
Primarily increased supplier competition				x	x	

The first discipline of eSourcing which is focusing on *sourcing process integration*, aims to achieve cross-functional integration within sourcing. The sourcing process integration discipline is single-handedly facilitated by the SAP Ariba system for the represented case companies. The case companies adopting it are pursuing interfaces between e.g. R&D/product owners and the purchasing department for improved specification management, or e.g. interface between sourcing and legal for improved contract management. Within this discipline an entire sourcing process is typically redefined to fit into its digital format, which in turn is implemented into the platform along with a series of gateways for managerial sourcing project sign-off. Inside the digital representation of the sourcing process in the eSourcing platform, the sourcing professional is typically required in some sort of sourcing strategy development phase to choose which sourcing approaches are to be used. Meanwhile the prerequisites of each approach, e.g. for conducting an eRA, are initially assessed in an overall project analysis phase. This way a more company-wide, structured and thought-through way of choosing sourcing approach is achieved.

The second discipline is primarily focusing on the *increased supplier competition* which is achieved simply by adding the sourcing approaches eRFx and eRA to existing sourcing process structures. This discipline seemed to be facilitated by most eSourcing ASPs. However it was clear that Scanmarket had the biggest emphasis on optimising the competitive setting by providing several different types of eRAs. Although, it should further be noted that all case companies which had adopted the process integration eSourcing discipline (except Zeta) had also simultaneously defined the goal to increase the supplier competition by adding eRFx and eRA sourcing approaches. However, when simply making an eSourcing platform with its corresponding sourcing approach available to the existing sourcing organisation and existing sourcing process structures, a set of difficulties arise. First of all, there are no guarantees if the use of eSourcing will be adopted. Secondly, there is limited support for how each sourcing professional is to address the newly added sourcing approaches of eRFx and eRA. Thus - even though the supply market competition focused discipline requires less process re-definition to implement digital process representations into the platform, it still requires extensive organisational training to ensure organisational adoption and compliance.

Meanwhile, the maturity in eRA utilisation among the case companies mimics the corresponding eSourcing focus quite well as seen in Table 6.6. There is evidence within the case material that the eSourcing discipline which focuses sourcing process integration is more complex and takes longer time to implement. The eSourcing discipline which focuses increased supplier competition, rather than sourcing process integration, might thus be a good way to get initial organisational traction in the use of eRAs.

Table 6.6. Extent of eRA utilisation.

Extent of eRA utilisation	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
High utilisation (>50 eRA events/year)				x	x	
Moderate utilisation (<50 eRA events/year)						
Very few eRAs conducted in total	x	x	x			x

6.1.6 Decision models for choosing sourcing approach

Concludingly, there are no reasons to conduct RFx through an email client if an eSourcing platform is available. The barrier which keeps organisations from adopting eSourcing practices is typically internal resistance from purchasers reluctant to change. When an organisation, and the reluctant individuals in particular, realises what benefits are brought about by eSourcing then traditional RFx tends to completely transition towards eRFx. The same reluctance is often the case especially for the use of eRA, as eRAs are usually completely new to the sourcing professionals when implementing eSourcing. Organisational compliance is best attained by deploying internal eSourcing consultant teams which facilitates and support in the implementation and transformation agenda. The sourcing approach decision model explained below to some extent assumes a setting characterised by internal organisational adoption.

If an eRFx has led as far as to eRFQ, then the next step is to ask if it is advantageous to proceed with an eRA. However, eRAs are more demanding as they require certain prerequisites in comparison to the less time-compressed eRFQ. Such eRA prerequisites are that there is a minimum of three approved suppliers, that the supplier bids are comparable and lastly that the SRM context has been assessed to ensure that the eRA does not risk hurting any strategic partnerships. It should be remembered that conducting eRFQ is an important preparatory step prior to the eRA as it helps in attaining some of the eRA prerequisites, such as bid comparability and solving miscommunications with suppliers.

Direct negotiation strategies with single suppliers are typically the result of certain barriers for conducting competitive supply market exercises. There are also cases when direct negotiations through F2F or targeted emailing are superior, such as when developing supplier relationships or when the category is particularly complex and requires extensive supplier collaboration to increase value creation or figuring out the specification. All cases expressed it as important with supply market analysis, which could typically mitigate such competition barriers by allowing for extension of the supplier base. However, what the supplier qualification and approval process looks like as well as what mandates the purchasing organisation has to approve suppliers often proves central for a manufacturing company's capability of developing a broad supplier base. The process integrated discipline of eSourcing could however prove useful in overcoming these difficulties, by e.g. introducing cross-functional interfaces and getting more stakeholders involved in the supplier approval decision and qualification processes.

A holistic decision model for how the choice of sourcing approach could be addressed in a general manner, relevant to any sourcing project, is shown in Figure 6.3. In regards to how the competitive landscape can be navigated, Figure 6.2 describes the logic based on its two main analytical parameters: *the number of approved suppliers* and *the ease of achieving bid comparability*. Although, as illustrated in Figure 6.3, eRFx and eRA are not opposing sourcing approaches, as an eRFQ should be conducted prior to an eRA in order to prepare the auction.

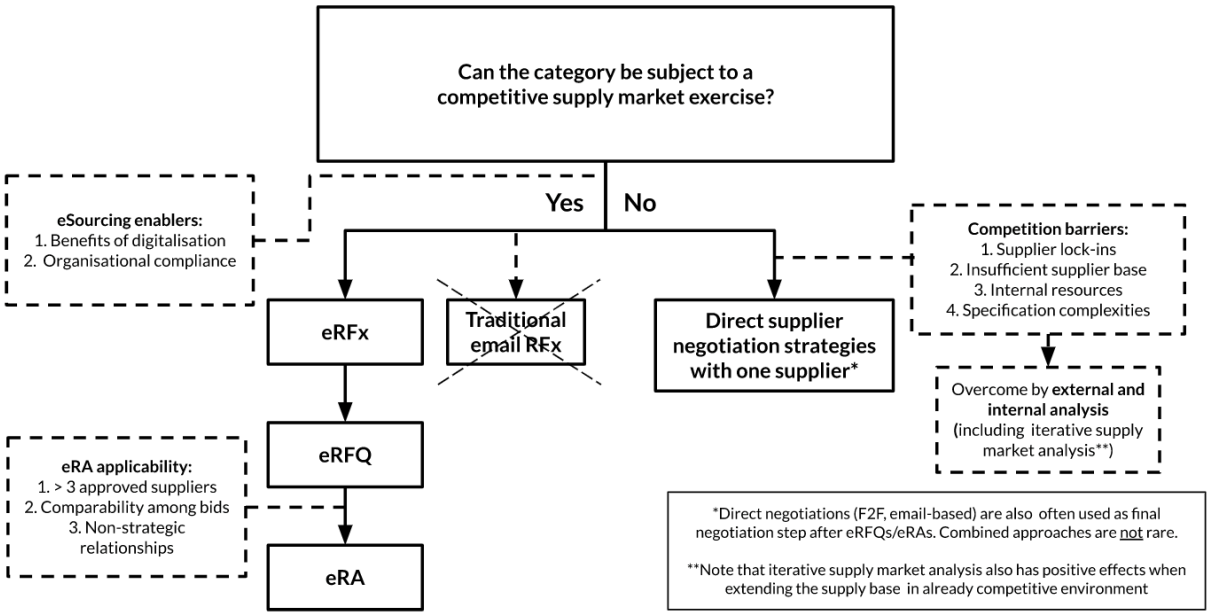

Figure 6.3. Decision model for choosing among available sourcing approaches.

As a final remark, all sourcing approaches are often combined throughout more or less strategic sourcing projects. The bigger the stakes, the more important to combine the different sourcing approaches for the sake of safeguarding balance between all relevant aspects. As an example, supplier's technical expertise in regards to how they can deliver products with technical complexities can be involved when initially discussing with suppliers about a complex set of specifications. Such discussions are preferably done by initial RFIs and RFPs based on broad functional specifications, followed by F2F negotiations in order not to limit innovation by strict and computerised comparable evaluation interfaces. However no approach is as competitive and shows as clear price reduction possibilities as the eRA, which pinpoints the necessity of adopting its use in order to maintain a good competitive position from a price perspective.

6.2 Configuration elements critical to eRA success

When interviewing and putting the cases together it was clear that the different configuration elements could be categorised into three layers or *tiers*, as seen in Figure 6.4. The following three sections of this chapter will in detail describe the configurations and goals of each tier, as well as the hierarchy between each tier, whereas the final section of this chapter will further develop how the tiers are to be assessed when configuring an eRA program.

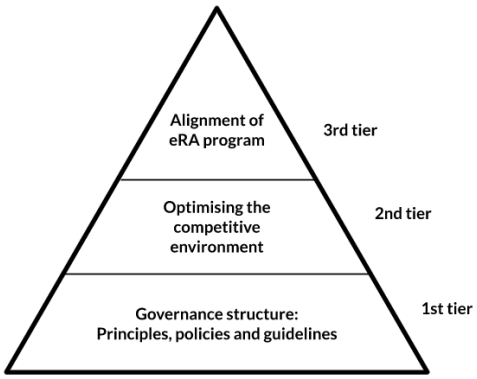

Figure 6.4. Three tiers of configuring an eRA program.

The first tier is the foundation in the 'governance structure'. The cases put forward the importance of having clear principles in regards to supplier relationships and how to conduct eRAs so that all stakeholders understand the rules and adhere to these. Within this 'governance structure' an additional configuration element was found outside of theory in the data infrastructure that the companies had to set up before starting the eRA program, what master data was needed and defining a strategy for how it was going to be managed.

The second tier is the configuration of the 'optimising the competitive environment' as in how to conduct efficient eRA events within the eRA program. What preparations needs to be done, how to design the event and increase the supplier bid engagement. This part was found very consistent with literature and no further configuration elements were found.

The third tier is the 'alignment of eRA program' focusing on how to integrate the eRA process with the overall company sourcing processes and making sure the new digitalised sourcing process is aligned with overall business strategy. The process and system integration of the eRA configuration as described in theory is located into this tier, whereas the underlying data generation strategy which the integration is built upon is part of the foundational first tier. An additional configuration element, eRA performance management, was identified during the case study which was also categorised into this tier

The idea behind the hierarchical structure of the model is the importance of its chronological order. The first and second tiers are important components to have in place before being successful in the third tier. Equivalently, the first tier is an important component to have in place before being successful in the second tier. Thus, the logical order is to successively move up the pyramid when configuring an eRA program.

6.2.1 Setting a governance structure: principles, policies and guidelines

The first tier of configuration elements are those which sets the internal organisational view on the utilisation of eRA events. The internal view is defined by an ethical governance structure consisting of eRA principles, policies and guidelines which supports the internal utilisation of eRA throughout the eRA program. The same configuration elements also embody an ethical foundation which suppliers can relate to, so that they know what they can expect when dealing with the buying company. In other words - the governance structure with its principles, policies and guidelines accounted for both the internal and external stakeholder perspectives in this regard. All case companies had defined their eRA governance structure early on in their eSourcing implementation with the goal of ensuring eRA recurrence through organisational compliance from a value-based perspective and external supplier sign-off as well as mitigating the risk of any harmful effects on supplier relationships. Additionally, this tier of configuration elements was rather static than dynamic in nature and stemmed from the buying companies' core business values and principles. The governance structures were for all companies to some extent explicitly defined into eRA Codes of Conduct, internal eRA policies or similar types of documents. All highlighted ethical principles, policies and guidelines which links to eRA governance structure are highlighted in Table 6.7.

Table 6.7. Configuration elements of the governing structure in eRA events.

Principle, policy or guideline	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Policy/level of buyer commitment	Internal policy (full)	Internal policy (full)	N/A	Internal policy (intent)	Internal policy (intent)	N/A
Supplier participation principles	Only approved	Only approved	N/A	Only approved	Only approved	N/A
Level of bid disclosure	Limited disclosure	Limited disclosure	N/A	Limited disclosure	Limited disclosure	N/A
Policies regarding bid disclosure	Internal policy	Internal policy	N/A	Internal policy	Internal policy	N/A
Defined ethical guidelines	Yes	Yes	N/A	Yes	Yes	N/A

The level of buyer commitment that the companies went into auctions with were based on internal policy rather than legal commitments. But it was under deep value-based convictions

that all case companies had defined internal policies regarding not using auctions merely as a price-discovery mechanism, without the intention of actually honoring its outcome. Delta and Epsilon alike both stated that it is often enough to communicate the intention of buying from a supplier based on the eRA outcome, to get the suppliers onboard in the process on the basis of buyer commitment. The defined buyer commitment policies had in turn a big impact on the pre/post-auction sourcing process balance. Also the more dynamic configuration elements such as the extent of eRA preparations and supplier communication requirements were significantly impacted by the buyer commitment policy.

Another important ethical aspect is the principles regarding the supplier invitation and participation principles. All case companies set clear examples by stating that only fully approved suppliers would ever get invited to an eRA event. Anything else was considered both unethical to the other suppliers which could actually be approved, as well as it would internally prove truly difficult to compare the eRA bids on equal terms.

Setting and externally communicating policies regarding disclosure of suppliers' bids is one governance element which both theory and the case study thoroughly pinpointed. Theory stated that full bid disclosure has a risk of discouraging suppliers to participate since they will potentially expose their price structures to their closest competitors. The case companies had clearly adhered to this theory recommendation, as they were all using different kinds of limited bid disclosure such as rank or traffic light disclosure on an internal policy basis.

The case companies standing in regards SRM based eRA utilisation policies are clarified in Table 6.8. Ensuring healthy relationships to all eRA participating suppliers and that the eRA event would not burn any relationship bridges is another point related to eRA governance which was frequently touched upon by the case companies. From one perspective, SRM in this regard came down to assessing the nature of the relationship when contextually analysing the fundamental applicability of an eRA. Some case companies were generally discouraged to use eRAs on suppliers whose relationships were segmented as partnerships. Meanwhile, others stated that there is no point in maintaining strategic partnerships if they are not competitively justifiable, and that conducting eRAs could be a good way of ensuring that. The main point identified in regards to SRM based eRA policies, is that its adequacy will vary depending on how valuable certain relationships or supplier segments are for the buying company. Each company thus needs to assess their own need for SRM based guidelines in regards to eRA utilisation. However, that incumbent strategic partnerships by nature can not be randomly reality tested by the occasional eRA (if the eRA prerequisites allow it) seems not to be the universal truth which is typically painted in eRA literature. However, the case evidence implies that it is true that the relationship trust and the collaborative nature tend to get strained if frequent and iterative price reduction emphasis is brought into a strategic partnership. Positioning the occasional eRA as an inevitable routine procedure was mentioned as an action which could prevent damaging the relationship while still ensuring price competitiveness within the collaboration.

Table 6.8. eRA utilisation and supplier relationship management.

SRM related eRA guidelines	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
eRA use principle based on SRM segments	No	Yes	N/A	Yes	No	N/A
SRM impact on eRA recurrence	Critical	Critical	N/A	Critical	Critical	N/A

From another perspective healthy supplier relationships seemed to often come down to only maintaining clear, unambiguous communication through the appropriate channels. One takeaway is that ambiguity from the supplier's point of view could also be derived from non-standardised use of eRA from the same buying company. If a supplier has dealings with one part of the buying company, they might expect the same governance structures when dealing with different part of the same company. In this regard, standardised eRA utilisation and equally standardised communication templates is to be considered safer.

Maintaining healthy supplier relationships and that no bridges are burnt, current or potential, was in turn considered by all companies as critical to a recurrent eRA program with bigger benefits than just conducting the occasional first strike auction in certain sourcing categories. The emphasis on SRM as a critical component of achieving eRA recurrence, as opposed to only the occasional first-strike auction, further highlights the importance of including SRM based eRA utilisation policies in the governance structure.

Lastly an additional configuration element, the *data infrastructure* which supports eRA utilisation and its performance management, was found in the empirics of the case study. Although not necessarily part of the governance structure, it shares similar characteristics in that it needs to be defined early on in the eSourcing implementation. Table 6.9 shows which companies highlighted the importance of such data infrastructures.

Table 6.9. eRA data infrastructure

eRA data infrastructure	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Defined data infrastructure/strategy	Yes	Yes	N/A	N/A	N/A	N/A
Data infrastructure defined with clear focus on eRA performance management	Yes	Yes	N/A	N/A	N/A	N/A
Deployment of eRA master-data management	Central	Central	N/A	Local super users	Local super users	N/A

The notion is that the infrastructure for data generation from eRA utilisation (and eSourcing in general) has to be defined early on in the implementation. This data infrastructure will serve as a critical component when developing performance management practices both in the implementation phase as well as in the more mature phases of eRA utilisation. The idea of defining this data infrastructure early on is that valuable data will generate over a longer period of time. It can then prove more useful and accurate once it is analysed in the eRA performance management process. In this regard, as highlighted by Beta, it would be wise to put eSourcing master-data management responsibilities on an internal (and preferably centrally deployed) eSourcing consultant team. Such a team is supposed to be the group of individuals with the best insights of which values data generation from eSourcing and eRA utilisation needs to provide over time. Thus they should arguably also be responsible for setting up the required data infrastructure.

6.2.2 Optimising the competitive environment

After having defined the fundamental governance protocols of the eRA program, the second tier of configuration elements regard excelling at eRA utilisation by optimising the competitive environment of the eRA events. Note that the second tier does not only regard initiating the eRA utilisation, but achieving true understanding of and excelling at conducting the eRA event in order to enable price reductions on a broader front. The configuration elements linked to this tier were the eRA design parameters, event preparations and the improvement of supplier bid engagement.

Table 6.10 highlights how design parameters of an eRA are configured at the different case companies. The first thing to observe is that the companies which are already conveying auctions in a larger scale prefer simple settings. By using well known auction types such as the English auction in combination with an intuitive bid disclosure setting and only using price to award the auction contract, the preparations turn out to be easier. Thus focus could instead allegedly be directed to value adding sourcing activities rather than administrative tasks such as designing complex auction formats which risks disqualifying the appropriateness of the eRA from a time perspective. The only company standing out in regard to its view on auction types was Beta who mentioned the intention to change auction types continuously in order to keep their suppliers alert and “on their toes”. This seemed unintuitive with limited benefits and was consequently considered unimportant to the success of an eRA auction as the other cases managed well without swapping auction types between eRA events. It was still understood

from the case companies that the second tier of configuration elements are more dynamic by nature and might be tweaked from event to event if it is fitting to relinquish the eRA simplicity in order to optimise the competitive setting when the stakes are high. The generic functionalities of the ASP can however be a limiting factor in this regard, as some systems seem to be more focused on offering the opportunity to optimise and leverage the competitive setting within the auction. No company had anything to add about the event length or closing rules, it did not seem to increase the competitive environment. All represented ASPs seemed to provide standard auction design solutions which fitted the buying companies well enough in this regard.

Table 6.10. Configuring the eRA design.

eRA design parameters	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Auction type	English	Change continuously	N/A	English	Simple formats (e.g. English)	N/A
Main award criterias	Price	Price	N/A	Price	Price	N/A
eRA mechanism	Contract allocation	Contract allocation	N/A	Price discovery	Price discovery	N/A
Event length	N/A	N/A	N/A	N/A	N/A	N/A
Closing rules	N/A	N/A	N/A	N/A	N/A	N/A
Pre vs. post auction balance weight	Pre auction	Pre auction	N/A	Unchanged	Unchanged	N/A

In theory it was stated that multivariable award criteria could exist, but all case companies opted for using the streamlined auction type with only price as the award criteria. This makes for simpler auctions but forces the purchasers to prepare more and not choose to use an eRA if the supplier's bids are not equivalent enough to be subject to a price-only comparison.

A divide did exist in how to view the eRA mechanism as Alpha and Beta intended to adhere to a contract allocation but Delta and Epsilon viewed the eRA as a method of finding the market price and then allocate the contract to the best supplier. However in their ethical principles both Delta and Epsilon both always intend to commit to buy after the auction. But having the hedge of not legally binding themselves to the auction result meant that they can choose the bid which they believe will have the lowest TCO. These are two different ways of conducting eRA and the situation the Delta and Epsilon is in demands a high level of trust from their suppliers. As long as they maintain this trust by following their governing principles, the eRA program is believed to function well.

There are multiple levels of analysing the auction process balance. The most prominent is that the companies that have running eRA programs claim that the process balance is unchanged. Even though thorough analysis is highlighted to be required before the auction, these analyses are not expected to be more time consuming than the analysis that would be performed if conducting preparations before any traditional RFx event. The expected change at Alpha and Beta is conversely that their new sourcing process will be heavy in the pre-auction activities due to extensive preparations, including eRA fitness analysis. The difference in views are also consistent with the communicated aim of buyer commitment, as Alpha and Beta intend to use full buyer commitment. It is for them extremely important that the preparations are perfect before the auction, shifting the process weight onto the pre-auction. With no full buyer commitment, as in the case at Delta and Epsilon, there exists leeway to not choose the winning supplier and therefore not having to put as much emphasis on the pre-auction process.

Table 6.11 confirms, in accordance with theory, the extreme importance of eRA preparations in order to achieve eRA event success. All cases put emphasis on the importance of conducting proper analysis before running an eRA, as part of an sourcing strategy development and eRA fitness analysis. The supply market analysis not only gives the purchaser an opportunity to find further suppliers to invite into the eRA but also gets to understand the market dynamics and if eRAs are appropriate for the product based on this dynamic. In combination with extensive category analysis the purchaser gets to understand the fitness of using eRA compared to traditional negotiations, based on the category characteristics. The determining factor of which

approach to follow would be the ease of providing clear specifications and the comparability between suppliers. If the specifications are unclear, or the company is unable to provide good specifications because of lack of competence it is probably safe to assume that direct negotiations with one or a few suppliers are better because the auction format would miss a lot of different aspects in the sourcing process.

Table 6.11. Preparing the eRA event.

eRA event preparations	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Supply market analysis prior to event	Yes	N/A	N/A	Yes	Yes	N/A
Category analysis prior to event	Yes	N/A	N/A	Yes	Yes	N/A
Importance of clear specification	Very important	Very important	N/A	Very important	Very important	N/A
Pre-qualification of participants	Yes	Yes	N/A	Yes	Yes	N/A
Purchaser training prior to event	Yes	Yes	N/A	Yes	Yes	N/A
Supplier training prior to event	Yes	Yes	N/A	Yes	Yes	N/A

The pre-qualification of participants ensures that the governing principles are followed and that only approved suppliers are invited to the eRA event. It was expressed to be important by all the case companies and often conducted in a preceding eRFQ before the eRA event. By following the governing principles and only having approved suppliers the competitive environment would be much stronger and the supplier having a strong incentive to place bids at the market price because they cannot count on winning the business if not having the lowest bid. This is the configuration element that truly creates and leverages the market competition.

Both training for the purchasers and the suppliers were seen as hygiene factors by the case companies. All had them and viewed it to be a requirement for organisational eRA success. Beta put emphasis on this and the importance of doing test auctions before every event to test the settings and be sure that everything works on the time or eRA. The contract value of an eRA is often too large to waste the time and effort of suppliers by having an auction that malfunctions. Furthermore, the need for eRA training can vary depending on how initiated into the eRA program the supplier base as well as the internal stakeholders are. In terms of assessing the level of internal and external eRA experience brings back the need for maintaining an infrastructure which enables data of both internal user and supplier eRA participation.

The last configuration element of optimising a competitive environment was the improvement of supplier bid engagement as seen in Table 6.12. Initially there was a confusion between the companies in how competitiveness could be configured, which rendered the answers difficult to interpret and not applicable to the study. When delving into the details of an eRA and the sizes of them it became more apparent for the companies what was asked for and clearer answers could be found. There was no evidence to suggest that supplier bid engagement would be diminished by a larger number of suppliers competing or a lower contract value.

Compared to literature, the contract values being subject to eRAs were significantly lower than expected. Schoenherr (2019) provided the lowest contract value limit in literature with a minimum of $150.000 for an eRA. But both Delta and Epsilon expressed that the contract value in an eRA is not that important. Especially, Delta regularly holds events one hundredth of that in size and Epsilon expressed that if an eRFQ already was done then an eRA could never have a too low value to be interesting for the suppliers. This is a completely new view of eRAs and is probably an effect of society becoming more used to the digital way of performing business. Adding the insights that neither did perform any additional bundling or lotting strategies beyond the normal processes it can be safe to assume that suppliers are willing to participate in smaller auctions than previously thought. On the opposite spectrum, no case gave the impression that contracts could ever be too large for an auction.

Regarding how many suppliers that had to be invited before considering an eRA event the only number ever to arise was three suppliers, which was consistent with theory. But the limit for maximum number of suppliers invited differed among the cases. Beta and Delta both provided figures in the range of 7-9 suppliers. The reasoning was that if inviting any more suppliers the additional benefits would not be there whereas the preparatory workload would only increase. An example was given by Delta when they had invited 15 suppliers to one event, but this was a special event with the goal of aggregating multiple business areas purchasing of one product. Therefore the limit was put aside in order to maintain good supplier relationships as all current suppliers were invited. This is an example of not being too static about the configuration element and instead prioritise the fundamental governing policies over the competitive environment. However, Epsilon expressed no maximum limit to an auction event and their largest event included an enormous 70 suppliers simultaneously. This number is huge and unparalleled in both theory and the other case studies. It does prove the possibility to invite large amounts of suppliers to one auction, providing that they all are approved and qualified to place comparable bids. But it should be noted that the eRA event with 70 suppliers held multiple lots and the suppliers did not bid on all the different lots, but the feature is still impressive and makes one reconsider the possibilities of eRAs.

Table 6.12. Configuration elements of supplier bid engagement

Improving supplier bid engagement	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Supply market competitiveness	N/A	N/A	N/A	N/A	N/A	N/A
Contract minimum value	N/A	N/A	N/A	15.000 SEK	No min	N/A
Contract max value	N/A	N/A	N/A	No max	No max	N/A
Bundling and lotting strategies	N/A	N/A	N/A	No	No	N/A
Minimum number of auction participants	N/A	3	N/A	3	3	N/A
Maximum number of auction participants	N/A	7	N/A	7-9	No max	N/A

6.2.3 Aligning eRA program to organisational strategy and process

Depending on the manner and discipline through which eSourcing and eRAs are being implemented, there are varying difficulties in integrating and aligning the eRA utilisation into the sourcing process structure and overall business strategies. Independent on if the eSourcing discipline is focusing process integration or merely the increased supply market competition, one of the following will need to happen. Either eRA utilisation will over time need to be adapted to the overall business strategy focus, or the overall business strategy will need to be adapted to eRAs increased emphasis on price attributes. From this perspective the third tier, which regards the process and infrastructural eRA integration as well as the performance management practices which oversees this integration, repeatedly connects back to the two disciplines identified in the previous chapter as well as each of their general views on eSourcing benefits.

In Table 6.13 it can be seen that both Alpha and Beta, through their process integrated discipline, had completely redefined their entire sourcing process to fit eSourcing and facilitate the additional cross-functional interfaces. The sourcing process redefinitions were deployed early on during eSourcing implementation. Their new processes had (except improved cross-functionality) a big focus on more extensive supply market and category analysis prior to the eRA in order to achieve comparability among supplier bids. Meanwhile Delta and Epsilon had initially maintained a laid back approach with no overwhelming process redefinition, but rather made eRA available as a tool within a “conduct competitive supply market exercise” step of their already existing company-wide sourcing process. Delta and Epsilon instead later focused on deploying gradual process improvements through internally developed best practices, with the aim of aligning the eRA utilisation with their sourcing process and strategies over time.

Table 6.13. eRA process integration.

eRA process integration	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
eRA impact on sourcing process	Redefined	Redefined	N/A	Partial	Partial	N/A
Sourcing process altered by internally developed best practices	Not yet	Not yet	N/A	Yes	Yes	N/A
Sourcing process altered by identified external best practices	Yes	Yes	N/A	No	No	N/A
Extended analysis phase within sourcing projects to adhere to eRA fitness analysis	Yes	Yes	N/A	No	Yes	N/A

The general pattern in these implementation approaches tends to be the difficulties of achieving true process and strategy alignment in eSourcing and eRA utilisation. The competition focused discipline is easier to implement in its initial phase, as its focus lies on getting started and attaining practical experience with eRFx and eRA. But it maintains a strategically shallow approach and a struggle to deeply align eRA utilisation with sourcing process and strategy. However, truly leveraging all possibilities of eSourcing utilisation will require that the traditional sourcing process is turned inside out while simultaneously asking the correct questions regarding what strategic adaptations are to be done. The difficulty with the competition focused discipline fundamentally lies in deploying the gradual improvements over time in an organisationally structured way, with clear attention to how strategic alignment is to be achieved. For a company with clearly stated cost leadership strategies, strategic alignment might not be a big issue. Whereas for a company differentiating itself e.g. through product leadership the difficulties of strategic alignment in eRA utilisation will quickly arise. Meanwhile, the process integration focused discipline is proven harder to implement and thus have greater difficulties in actually getting started with the eRA program. However, once the organisational and strategic thresholds of eRA and eSourcing utilisation has been overcome, the ease of achieving the strategy and process alignment is easier and thus the gains by deploying the eRA program with maintained attention to overall business strategy could be substantially higher.

Independent of which discipline is chosen, final process integration tweaks such as finding the optimal pre-/post auction process balance for the company in question is often found first when the company is further along into their course of eRA maturation. Several factors will come into play in identifying the optimal level of eRA process integration, such as the complexity of the category specifications and supplier approval process as well as the contextual value of managing specific supplier relationships. Also a company's possibilities of bundling certain categories and the complexity of their specifications will come into play when integrating eRA utilisation into the underlying sourcing process and the overall business strategy. Especially to what extent a supplier's expertise should be involved in the eRA lot preparation.

One thing which mainly the companies that did not qualify for the case segmentation based on their low experience and negative view on eRA benefits pinpointed (as seen in Appendix A), is that available sourcing lead time also impacted the process balance. The contention is that low available sourcing lead time would sometimes risk resulting in going into an eRA with insufficient preparations made. Thus they would still spend a lot of time in post-auction negotiations to create clear out potential ambiguities among non-price attributes of the bids. This was however highlighted mainly as an argument as to why the choice was made not to utilise eRAs at all.

However the key takeaway is that many of those factors, which influence what the optimal level of process integration and strategy alignment looks like, are identified from different perspectives. These perspectives in turn often require a level of eRA experience and maturity, making it hard to reach the third tier simply by designing the eRA program's infrastructure and governance structure with high initial detail. Some of these perspectives are company specific such as the level of centralisation and the organisational opportunities which that entails. Meanwhile, others are industry or industry segment specific such as the amount of downstream bill of materials or the complexity of the supplier approval process. Also, observance and adherence to contextual factors of the specific sourcing project is important. This could revolve

around the differences between straight/modified rebuy or completely new task sourcing situations. It could revolve around if it is a first strike auction or if the supplier base already is initiated to the increased supply market competition from an eRA event.

Familiarising with the factors and optimising the process based on the different perspectives requires internal maturity in regards to eRA and eSourcing in general. Attaining such organisational maturity takes time and therefore an initial balance between the two disciplines could prove beneficial. Furthermore, in order to even be able to identify such factors there is an increased necessity to analyse the internal and external environments and doing so in several layers of complexity. Alpha was most advanced in this regard as they had a central analyst team linked to their source-to-contract practices. But a relatively persuasive consensus regarding eRA requiring extended analysis phase within the sourcing process could be seen within the case study. Meanwhile, Delta stood out in their statement that a need for further analysis is not required to identify opportunities for eRA as compared to e.g. RFQ.

Another important configuration element is the infrastructural integration which is an enlarged meaning of the previous coding *system integration*. Fundamentally, infrastructural integration means to which extent mainly the organisation and systems have been integrated with the use of eRA utilisation. Organisational integration in turn refers to how the organisational roles and capabilities are formed after the utilisation of eRAs. As an example, as seen in Table 6.14, almost all companies had deployed new roles linked to eSourcing but which were responsible for different parts of the eSourcing initiative or eRA utilisation. Alpha had a central eSourcing analyst team which both assisted with internal and external analysis in strategic sourcing projects as well as taking the entire responsibility of conducting the eRAs during the implementation phase to ascertain control of the initial eRA experience. The long-term goal of this team was however to over time transition towards facilitating organisational capability development regarding eRA utilisation parallel to the analyst responsibilities. Meanwhile, Beta was the only emphasis on integrating new roles into the sourcing process which would have a big focus on master-data management to reap improved values from eSourcing and eRA utilisation by generating more accurate supplier data. Other than these mentioned internal eSourcing consultant roles, no major new organisational deployments were mentioned.

In regards to eRA specific capabilities, there were certain insights made in the case study. Changes in for example the capability requirements of category managers depend on what level of eSourcing and eRA support is available within the organisation. If eRAs are only to be conducted centrally, as is the case at Alpha, the capability requirements of the local category managers are not altered significantly. If eRAs and eSourcing in general is only made available to the sourcing organisation under the promise of certain centrally facilitated training sessions, the fundamental capability requirements in regards to eRA events will most likely be higher in order to get organisational adoption. The increased capability requirements will then be linked to identifying opportunities of eRA utilisation, based on the category and supply market characteristics. Other than that, mostly the anticipated improvements within the organisational cross-functionality was mentioned. This was true specifically for the process integration focused eSourcing discipline, where specification management, supplier approval and contract management organisations would be impacted through their new cross-functional interfaces.

System integration, coded as previously, is the integration of eSourcing towards other legacy systems such as ERPs. Beall et al. (2003) stated it possible but arguably sup-optimal to implement eSourcing in a non-integrated manner, although leaving no suggestion of how to achieve higher values from system-integration. In this case study, most companies utilised eSourcing in a non-integrated manner from a system integration perspective. The idea that the source-to-contract platform would be a source of clean data. Contract management is to be considered an exception for this rule, whereas it does not exactly have an impact to eRA utilisation per se. Alpha was the only company which did show signs of integration towards other central IT systems, although no information regarding how this worked from an architectural point of view was shared. Alpha further expressed concerns regarding how lack of

system integration could potentially prove to be a bottleneck for e.g. how further automation within the sourcing process and the possibilities of introducing the latest frontiers of eSourcing such as RPA, machine-learning and cognitive agents.

Table 6.14. eRA infrastructure integration (system and organisation)

eRA infrastructure integration	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
eRA (organisation) infrastructure integration	Yes	Yes	N/A	No	Yes	N/A
eSourcing team facilitating organisational eRA training	Eventually	Yes	N/A	Yes	Yes	N/A
Central analyst team ensuring eRA applicability	Yes	No	N/A	No	No	N/A
Central eRA team conducting all eRAs	Yes	No	N/A	No	No	N/A
Required category manager skills impacted by eRA utilisation	No	Yes	N/A	No	No	N/A
Emphasis on central master-data management	No	Yes	N/A	No	No	N/A
eSourcing and eRA data generation integrated with other IT systems	Yes	No	N/A	No	No	N/A

Developing appropriate KPIs is one way of aligning practice with strategy, as what gets measured usually gets done. However in regards to how the performance in eRA utilisation is adequately managed, many questions remain unanswered. Millet et al. (2004) introduced a set of KPIs to specifically measure supplier conversion throughout an eRA event. Other than that there is limited coverage in literature of how to measure performance of eRA utilisation. What could be pinpointed from the case study, as seen in Table 6.15, is that data generation and that the organisation has access to accurate data is critical for eRA performance management. This once again brings up the question of how thought-through the data infrastructure and the plans for master-data management are. Setting the initial data infrastructure is considered to be critical in the first and fundamental tier of eRA configuration. This is mainly because having set up a poor data structure might imply repercussions in the third tier during the eRA performance management.

Primarily Alpha and Beta had kept close track of supplier conversions throughout the eRA invitation and participation process. Although no clearly defined KPIs were mentioned in the interviews, these case companies still gave the impression that such KPIs were being monitored. This impression was based on the clarity in their informants' answers regarding supplier conversion rate and internal organisational eRA adoption and how closely they had been keeping track of such aspects of eRA performance. The realised cost savings from eRA events were monitored by all companies, and is by nature closely tied to the companies' overall savings targets. Beta mentioned that the category structure as well as the amount of eRAs conducted and savings realised over time in that category can be valuable information. Their idea is that it could be used to measure if a category is at efficient pricing and no more first strike auction outcomes can be expected, although no such measurements were in place at Beta yet. It was also pinpointed as a good indicator of when a category could be ready for an additional "supplier price squeeze" through an eRA event.

Table 6.15. eRA performance management

eRA performance management	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
KPIs regarding realised savings from eRAs	Yes	Yes	N/A	Yes	Yes	N/A
KPIs regarding supplier eRA conversion	Yes	Yes	N/A	N/A	N/A	N/A
KPIs regarding internal eRA adoption	Yes	Yes	N/A	Yes	No	N/A
Data infrastructure considered critical for high level eRA performance management	Yes	Yes	N/A	Yes	Yes	N/A

6.2.4 Configuration model for eRA program success

The hierarchical configuration model along with its three tiers, as well as how each tier relates to the identified configuration elements and the desired configuration outcomes of each tier is summarised below and depicted in Figure 6.5. A company either conducting eRAs or planning to implement an eRA program can use this model to understand what configuration elements

exist and how they affect the success of utilising eRAs. It will guide the implementation and maturity of an eRA program to focus on the most important configuration elements in the first tier and then develop into the higher tiers, realising greater success.

First tier - "Governance structure":
The first configuration tier consists of the three identified configuration elements *eRA governance*, *supplier relationship management* and the *defined data infrastructure*. The tier's underlying goal is to ensure eRA recurrence by achieving internal organisational compliance from a value-based perspective and external supplier sign-off as well as mitigating the risk of any harmful effects on supplier relationships. The goal of the data infrastructure configuration element is to facilitate value adding analyses throughout the eRA program, to monitor and understand its development over time. All of the configuration elements within the first configuration tier are static in nature, as they are based on the buying company's core business values, and should thus be defined early on in the eRA implementation.

Second tier - "Optimising the competitive environment":
The second configuration tier consists of the three identified configuration elements *eRA event design parameters*, *eRA event preparations* and *improvement of supplier bid engagement*. The goal of this middle configuration tier is to leverage sourcing situations characterised by a competitive environment, in order to enable sustained price reductions on a broader front. This is typically achieved by gaining true understanding of and excelling at conducting the eRA event. The configuration elements in this tier are dynamic by nature, and can thus be tweaked on a sourcing project basis if it fits the context. Although, too complex eRA events tend to make both internal and external stakeholders opt away from the choice of utilising eRAs.

Third tier - "Alignment of the eRA program":
The third configuration tier consists of the two identified configuration elements *process and infrastructural eRA integration* as well as *eRA performance management*. The desired outcome of the third configuration tier is to integrate the eRA program with the underlying sourcing process and to ensure strategic alignment between eRA utilisation and overall business strategy. The shift from the second to the third and highest tier embodies the general direction in which most companies tend to steer towards over time in their eRA utilisation. Reaching the highest tier requires strategic alignment between the utilisation of eRAs and the company's fundamental sourcing process and overall business strategies. This is the point where recurring eRA utilisation will prove to be a strategically sustainable approach, but achieving that level of eRA understanding and strategic alignment require a certain level of organisational eRA maturity.

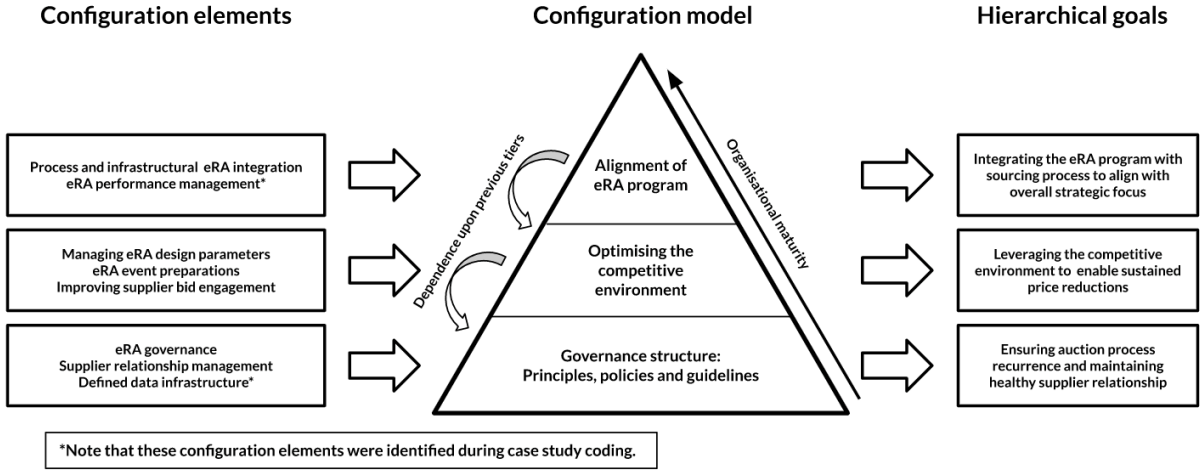

Figure 6.5. Hierarchy of configuration elements and the corresponding desired outcomes.

The general idea is that a good foundation for eRA utilisation as well as organisational maturity and understanding in regards to eRA utilisation (i.e. delivering on the configuration goals in each lower tier) is required to ascend to the top of the configuration model. Companies adopting the supply market competition focused discipline of eSourcing tend to begin in the second tier of eRA configuration and are often struggling to get to the third tier because they are lacking the structured foundation which is attained in the first tier. Meanwhile, companies under the process and infrastructure integration focused discipline will have difficulties in actually getting started with eRA utilisation on a large scale. This is often due to too much focus on finding "the optimal process" from the start rather than giving enough organisational attention which the new sourcing approach of eRA certainly will require.

Furthermore, an important connection between the first and third tier is how an initially developed data infrastructure enables expedient performance management. Whether it is maintaining a well structured supplier master-data to know when suppliers are susceptible to an eRA event, or paying the extra ASP fee for facilitating one account per organisational user to monitor individual eSourcing adoption, such choices are better to make early on in the implementation. The same goes for having defined a clear category structure which can be analysed in order to identify opportunities for competitive supply market exercises.

Lastly, it should be noted that this study's interpretation of eRA configuration differed from most traditional and contemporary eRA configuration literature. The difference being that this study covered the configuration of an entire eRA program rather than only a single eRA event. This interpretation stemmed from how the cases companies' eRA program based take on configuration. It was also strongly influenced by how Emiliani (2000) insightfully highlighted certain strategic contradictions in eRA utilisation. His highlighted contradictions were mainly the clashes between supplier collaboration SRM strategies and constantly increased internal cost reduction targets as well as the clashes between the frequency of cost reduction initiatives and supplier's expectations for contract renewal based on their performance. These strategic contradictions outlined the need to develop a more holistic take on configuring eRAs, resulting in the configuration model in Figure 6.5 which focuses on achieving a strategically aligned eRA program where the eRA recurrence is sustainable and extends the benefit of an occasional first strike auction in random categories.

7 Internal case at Trelleborg Group

This chapter portrays the principal case company, Trelleborg Group. It describes the business, its purchasing organisation and the eSourcing initiative that lead to this research study. The first two sections are described on a group level while the last section of the chapter investigates one of the business units to get a practical understanding of the implications of eSourcing from a purchaser's perspective.

Trelleborg Group's general strategy has been to build market leadership positions in chosen nisch segments. Their market leadership strategy is facilitated by four strategic pillars, depicted in Figure 7.1 (Trelleborg AB, 2020, p. 34). As a result of the strategy implementation, Trelleborg Group has been under intensive organisational change due to a large number of acquisitions and divestments over the years. In 2019 Trelleborg Group conducted 8 acquisitions of either R&D, manufacturing or distribution based companies of industrial polymer solutions, mainly linked to the BA Trelleborg Wheel Systems (Trelleborg AB, 2020, p. 35). While the acquisition and divestment based strategy has been highly profitable for Trelleborg Group, it has also both led to and required a significant level of decentralisation (Trelleborg AB, 2020, p. 4, 34).

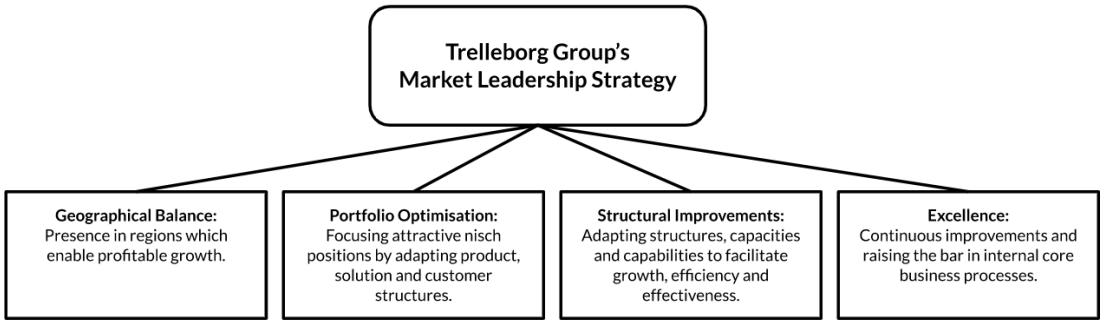

Figure 7.1. Strategic pillars of Trelleborg Group's market leadership strategy. (adapted from Trelleborg AB, 2020, p. 34-35)

The internal study conducted at the business unit Engineered Coated Fabrics was highly influenced by three of these pillars. Firstly the product and customer related nisches of the portfolio optimisation would show tendencies towards supplier lock-in. Secondly Trelleborg Group's decentralised organisation, and the structural improvements which it enables, would also have to be taken into consideration when assessing with what level of persuasion to implement the newly acquired eSourcing approaches. Lastly the organisational capabilities nurtured by one of the five Excellence Programs, the PE program, served as the foundation upon which the main conclusions and suggestions could be presented.

7.1 Trelleborg Group's purchasing strategy and organisation

Trelleborg Group's purchasing governance is carried out by the PE Board, depicted in Figure 7.2. Apart from maintaining purchasing related corporate governance, the PE Board represents the operational organisation that decides on KPIs, work processes, etc. Furthermore, the PE Board is responsible for preparing suggestions for improvements and other measures to the Group Management team.

The high level of decentralisation and the big spread in product and customer segments are barriers to defining and realising company-wide category and supply market synergies and cross-business area purchasing strategies. Central management of certain high volume categories are however in place by the roles Lead buyers and Country Coordinators. Furthermore, continuous purchasing improvement activities are addressed and facilitated by the PE program.

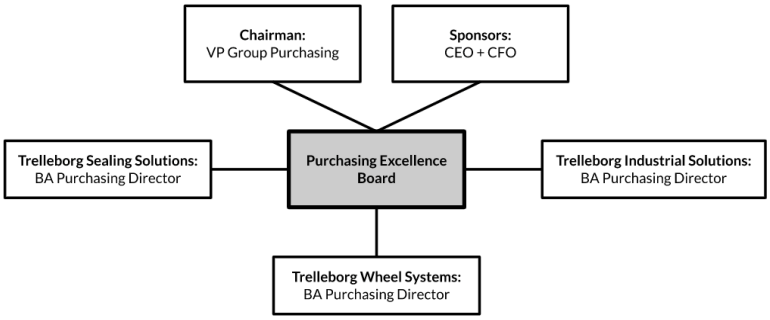

Figure 7.2. Trelleborg Group's Purchasing Excellence Board.

Being decentralised has for Trelleborg Group's purchasing organisation meant that mandates regarding purchasing related decisions to a great extent are positioned on a local level. In Trelleborg Group's organisation, that typically means business area or not too seldom even business unit or site level. In addition, the system data infrastructure is spread over a big cluster of approximately 50+ different ERP system licenses and various legacy systems. In regards to identifying purchasing synergies which transcends between business areas and units, the level of decentralisation in the organisation and system infrastructure has proven to be somewhat of a barrier. Despite the barriers several initiatives has been undertaken to increase cross-business area purchasing collaboration and coordination, including:

- Establishing cross-boundary purchasing coordination roles *Lead Buyers* and *Country Coordinators*
- Establishing the PE Board and program
- Authorising the PE Board to develop company-wide purchasing strategies
- Driving change through annual PE plans
- Develop the organisational purchasing capabilities through several educational packages facilitated by the PE program

Centrally, the purchasing organisation is structured according to Figure 7.3. Locally there are however big variations in both organisational purchasing structures, roles and capabilities depending on the business area and unit.

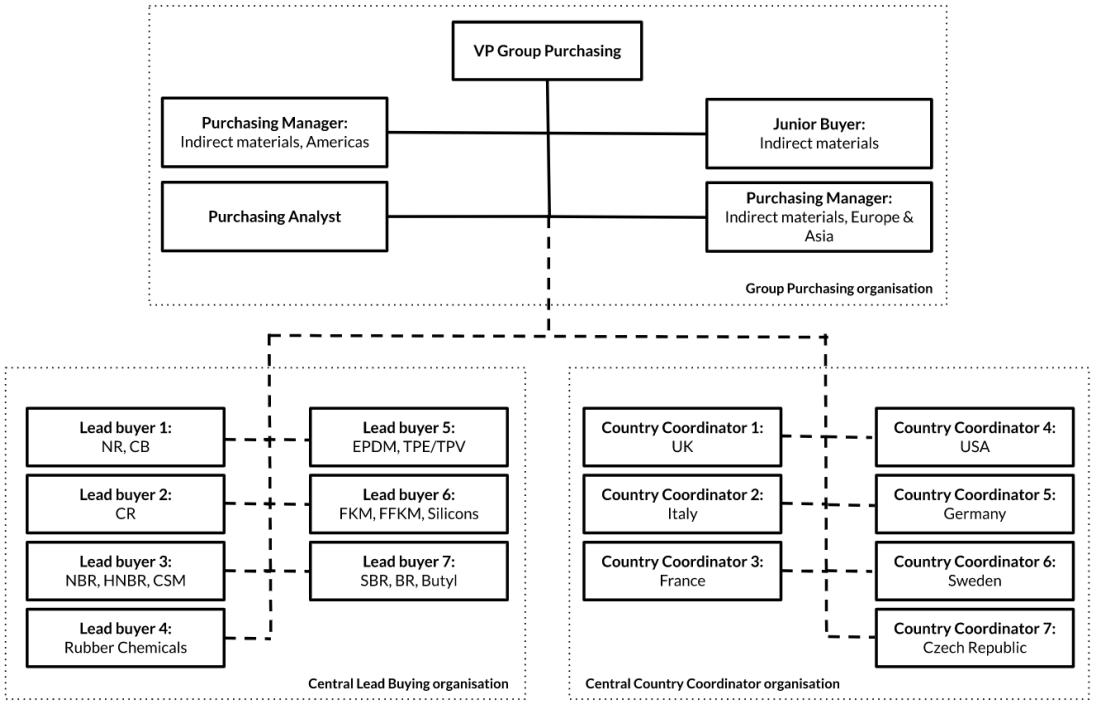

Figure 7.3. Group Purchasing, Lead Buyers and Country Coordinators.

7.1.1 Roles and capabilities

Every site typically has one, or up to a few, strategic purchasers which are responsible for conducting procurement activities. For direct categories these are mainly done per list-based prices with a pre-approved supplier base, rather than volume-based contractual commitments to specific suppliers. The strategic purchasers are also continuously analysing, categorising and overseeing the sites spend categories as well as existing supplier relationships based on a set of analytical tools pushed out into the organisation through the PE program.

As seen in Table 7.1, certain high volume and cross-business area direct material categories are managed by seven centrally organised lead buyers. The aim of this is to achieve cross-business area purchasing coordination. The lead buyers are responsible for category management, sourcing and SRM within their assigned categories. The categories managed by Lead Buyers amount to roughly 35% of total direct spend. The lead buyer responsibilities are held parallelly by skilled negotiators, e.g business area purchasing directors as well as the VP Group Purchasing.

To achieve synergetic coordination between business areas and business units within indirect categories, seven Country Coordinators have similarly been assigned. Country Coordinators coordinates sourcing, contract and SRM responsibilities within their assigned geographic regions. For Trelleborg Group, the Country Coordinators are divided between the regions: UK, USA, Italy, Germany, France Sweden and Czech Republic. The sourcing projects managed and geographically coordinated in the key countries by Country Coordinators amount to roughly 65% of total indirect spend.

Table 7.1. Direct/indirect categories managed by Lead Buyers/Country Coordinators.

Direct Category clusters (managed centrally by Lead Buyers)		**Indirect Categories (managed centrally by Country Coordinators)**
NR, CB	EPDM, TPE/TPV	Energy
CR	FKM, FFKM, Silicones	Travel
NBR, HNBR, CSM	SBR, BR, Butyl	Company Cars
Rubber Chemicals		Mobile Phones

7.1.2 Purchasing Excellence program

The PE program is one out of Trelleborg Group's five Excellence Programs, as seen in Figure 7.4. These Excellence programs aim to sharpen the core business processes by maintaining continuous improvements, to enable the sharing of best practices, creating engagement and commitment as well as developing organisational competencies. Ultimately, the long term goal with the Excellence programs is to boost value generation by systematically working with awareness, inspiration, follow-up and execution as well as equipping the employees with the appropriate tools.

Figure 7.4. Trelleborg Group's five Excellence Programs.

The PE program in turn aims to secure competition in all aspects of sourcing, while ensuring that all sourcing projects are carried out based on Trelleborg Group's uniformly defined sourcing process with clear rules for decision-making. Furthermore, local supplier and category strategies need to be developed according to Trelleborg Group's commonly defined interpretation of the Kraljic Matrix with corresponding activities for each of the quadrants. To

help the decentralised purchasing organisation through this continuous improvement, a set of guiding core purchasing principles have also been defined which must be complied with at all times.

At each business area, the main KPIs which are monitored are *quality*, *delivery* and *cost* - as these are highly focused on the operational performance. Centrally, towards each business area, the KPI *percentual annual savings* is the most focused KPI.

7.1.3 Standardised purchasing practices

In order to ensure that all sourcing projects are carried out in a uniform manner a broadly defined sourcing process, as seen in Figure 7.5, has been developed which is applicable to all of the sourcing contexts encountered by Trelleborg Group. This sourcing process is used mostly for describing a sourcing project at Trelleborg Group in broad terms, e.g. when cross-functional understanding of the sourcing project context and characteristics is needed. For more detailed information regarding what each step might include and how competitive supply market exercises are conducted in practice, Trelleborg Group's 16 week RFQ process is described below.

Figure 7.5. Trelleborg Group's uniformly defined sourcing process.

Furthermore, the prerequisites for each sourcing project are to a great deal dependent on how the category and supplier base have been analysed and categorised. In the strive for uniform sourcing practices, Trelleborg Group have thus interpreted the Kraljic Matrix and developed it into a tool which is deemed to fit their decentralised organisation through semi-automated spreadsheets. Their version of the Kraljic Matrix and the corresponding sourcing strategies are shown in Figure 7.6.

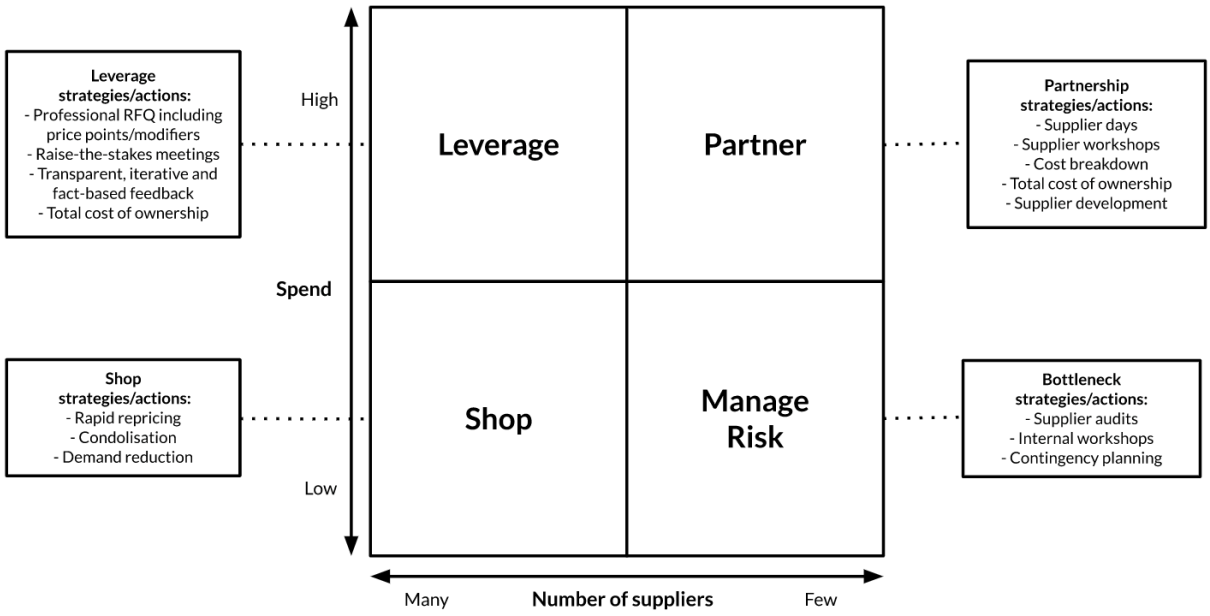

Figure 7.6. Trelleborg Group's version of the Kraljic Matrix.

For Trelleborg Group's shop quadrant, sourcing professionals have been encouraged to either consolidate demand to increase leverage or conduct rapid repricing projects. Rapid repricing projects are price re-negotiations conducted directly towards current suppliers. There are three types of such projects, which are based on any of the three topics:

- *General price reduction:* Direct price negotiations with supplier due to e.g current market situation or as a result of new market benchmark insights
- *Extended payment terms:* Direct negotiations with supplier regarding payment terms due to the temporary need for increased cash flow
- *Revised specifications:* Direct negotiations with supplier regarding price points and levels due to altered purchasing specifications

For the leverage quadrant, sourcing professionals are encouraged to use Trelleborg Group's commonly defined 16 week RFQ process, as seen in Figure 7.7. In addition to this competitive market exercise, the sourcing professionals are supposed to be transparent with suppliers standing throughout the sourcing process, to ensure that all suppliers have the chance to adapt their competitive bids.

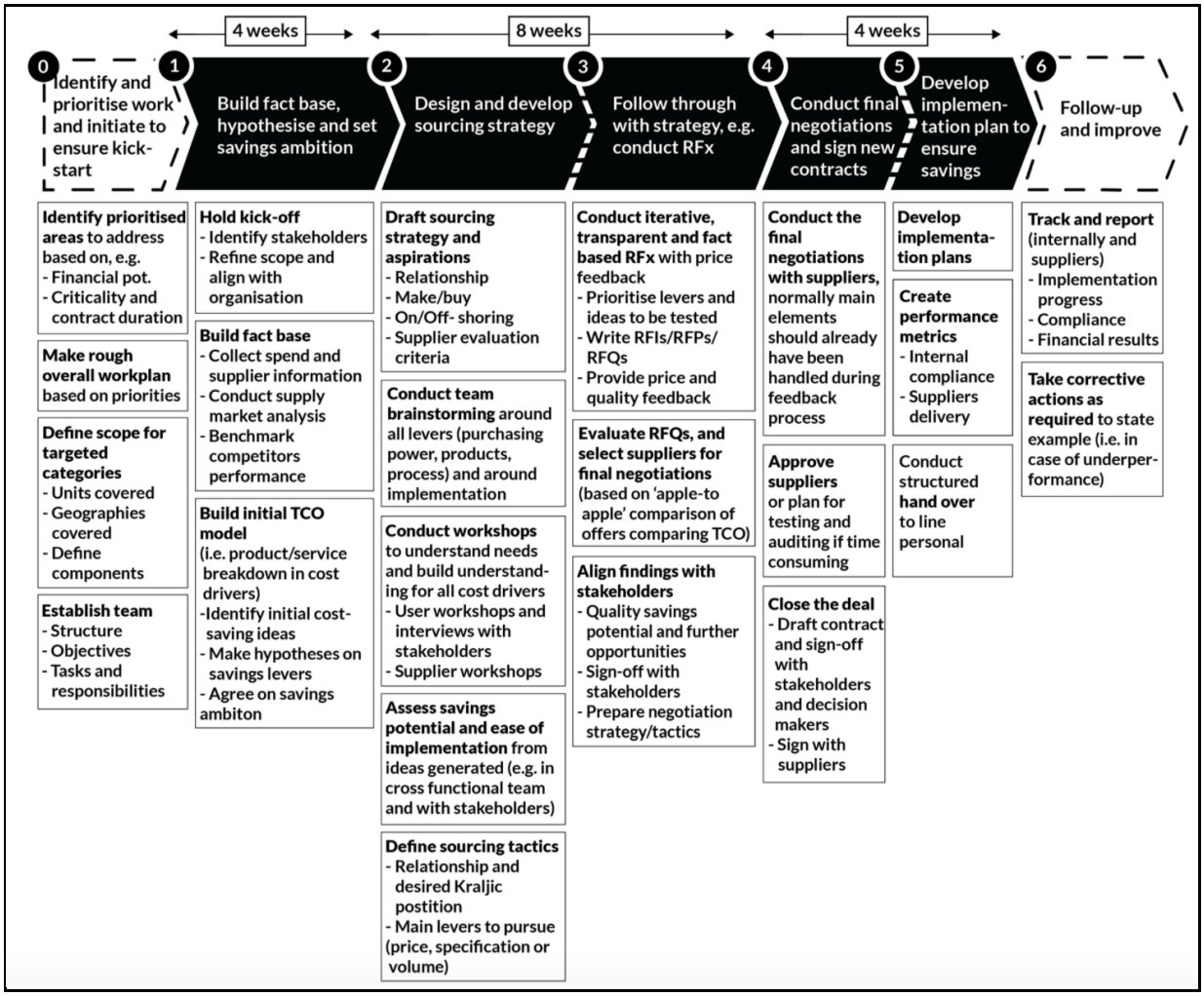

Figure 7.7. Trelleborg Group's uniformly defined 16 week RFQ process.

Lastly, as guidance in regards to how these standardised tools and practices come together throughout Trelleborg Group's decentralised purchasing organisation, a set of core purchasing practices and methods of achieving compliance have been defined as seen in Figure 7.8.

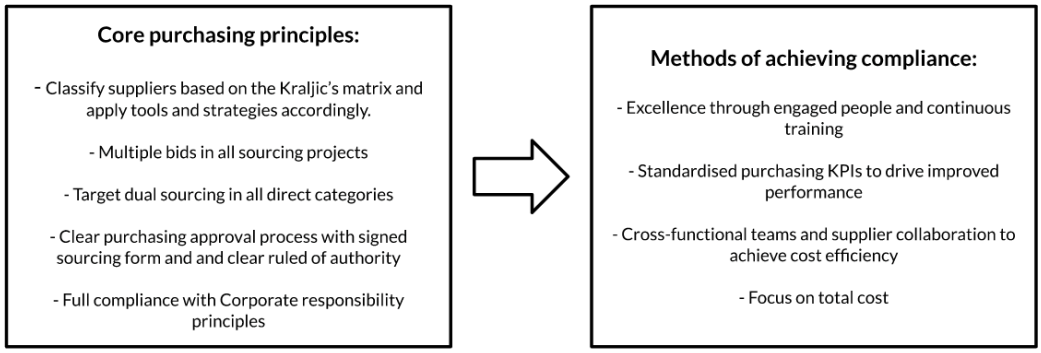

Figure 7.8. Trelleborg Group's core purchasing principles and ways of achieving compliance.

7.2 Trelleborg Group's recent eSourcing initiative

The central Group Purchasing had a few years ago identified a trend that whenever recruiting strategic purchasers or other sourcing professionals, the questions of what type of eSourcing platforms were used occurred.

The early hype of eSourcing and source-to-contract platforms was intentionally avoided due to uncertainty regarding if it would be viable for Trelleborg Group's decentralised organisation. However when seeing the recent trend, Group Purchasing and the PE Board were forced to further investigate what values digitalisation of strategic purchasing could bring to Trelleborg Group.

7.2.1 Goals and strategy

After initial assessments, the primary goals of the eSourcing project is to increase company-wide visibility and transparency regarding what occurs throughout the decentralised organisation in regards to sourcing. The secondary goal is to drastically increase both the volume and frequency of when competitive market exercises are conducted, such as the defined 16 week RFQ process. In other words, it is safe to say that Trelleborg Group's eSourcing initiative can be labeled under the increased supplier competition discipline.

Some local internal resistance regarding the applicability of eSourcing on Trelleborg Group's purchasing practices was identified by Group Purchasing and PE Board early in the pilot project. However, the strategy for how to address the follow-up eSourcing implementation initiative has still been defined as a broad rollout of the project with intensive internally managed general eSourcing organisational training agenda. Organisational training material and format for how to conduct eRAs will initially be facilitated by a consultancy firm, provided eRAs novelty characteristics within Trelleborg Group's organisation. The consultancy has extensive experience from eRA programs in supplier approval demanding industries such as automotive and aerospace and is thus deemed to understand several of the barriers faced by Trelleborg Group.

7.2.2 System users and permissions

The initial structure of Trelleborg Group's system users follow four different roles: Event Owner, Event Manager, Event Coach and Event Spectator. The system users are described in Figure 7.9. The people behind these roles are ordinary purchasers, they might work on any level in the organisation except for the Event Coaches which all belong to group or BA level.

The Event Owners do not have permission to create their own event and one reason for this is that the Group Purchasing wishes to start small and gradually expand the eSourcing program as more knowledge is gathered, not letting everyone to create events without proper preparations. But mainly the reasoning has been to keep costs low as there is a price to every user and in this initial stage of only trying out the system a very cost sensitive approach has been chosen.

The Event Manager and the Event Coach both have all the permissions in the eSourcing system and thus their responsibilities are mainly different in the organisation. The Event Coaches are looked upon as 'Super Users' that can provide expert help as internal consultants for any eSourcing event. In the initial stages of implementation there should be one Event Coach dedicated to each sourcing event, but as the number of events grow and the Event Managers attract more knowledge about eSourcing it is expected that the Event Coaches will be less involved in the events and consulted only when needed.

The Event Spectators can be invited to the sourcing event. There exist two types of spectators, the first is permitted to answer questions and communicate with suppliers in the event and the second is only allowed to observe and follow the event. This functionality helps utilise the cross-functional workflow by inviting stakeholders from different departments, e.g. R&D, logistics, finance.

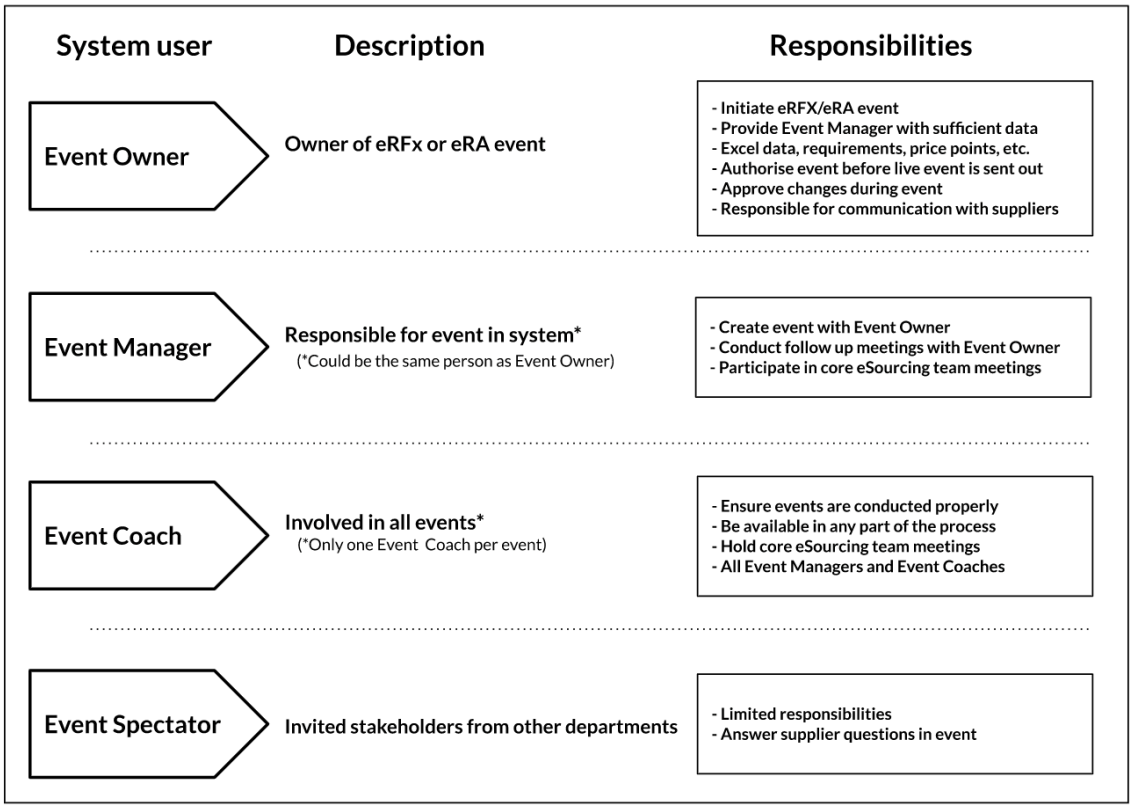

Figure 7.9. Description of system users and their responsibilities.

Because no central team working full time with eSourcing exists all of the Event Managers also operate as Event Owners as they too are purchasers and have to conduct their own sourcing events. The Event Coaches follow a similar path as they not only act as Event Managers but also Event Owners for their respective purchasing. The Group Purchasing responsible for the eSourcing initiatives believes that both the Managers and Coaches will gain broader perspectives of the different roles and have an increased learning curve because of this.

Within the organisation the Event Coaches hold bi-weekly eSourcing team meetings with all of the Event Managers. In this forum the progress of current events are addressed and the results of finished are announced. The purpose is to share knowledge through the purchasing organisation, mainly because the organisation is very decentralised and no other forum did exist to convey the information in an efficient way. The BU's and the number of sourcing events available for each local purchaser are too small to have the fast learning curve wanted during the implementation phase.

7.2.3 Defined eSourcing process structure

Trelleborg did not reengineer the sourcing process with the use of eSourcing but instead aimed to mimic the already existent process. Several different eSourcing processes were provided and but in this section two are selected as they portray the perspectives needed.

The first is a schematic sketch shown in Figure 7.10. It does not entail the full sourcing process but instead it is used in learning material by the Group Purchasing to explain the responsibilities of the different system users in the eSourcing process. The Event Owner is a purchaser leading the sourcing process and the Event Manager helps them facilitate this in the eSourcing platform.

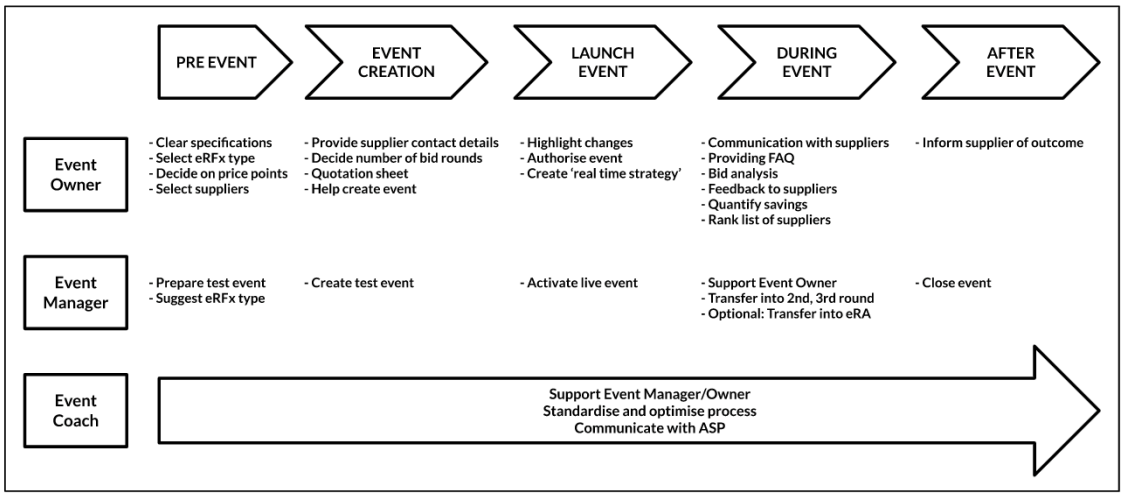

Figure 7.10. System user responsibilities in Trelleborg Group's Scanmarket platform.

Pre event: The Event Owner provides clear specifications to use during the process, and the price points that will be used in it. The type of eRFx (eRFI/eRFP/eRFQ) is chosen in collaboration with the Event Manager who then prepares an event.

Event creation: When creating the event the Event Owner provides all the necessary information needed, e.g. supplier information. Already before the event is created the number of bid rounds is decided in order for all suppliers to know the guidelines. When all is set the Event Manager creates the event as a 'test event'.

Launch event: The test event is inspected by the Event Owner and they highlight any changes needed to be done. With the changes done they authorise the Event Manager to activate the test event into a 'live event'. An important step is to create a strategy of how to operate during the live event before launching it.

During event: When the event is live the Event Owner is responsible for all communication with suppliers. They might invite other stakeholders to answer questions otherwise a FAQ is created that collects all the general questions by suppliers and let the answers be available for all. During and in between rounds the Event Owner conducts bid analysis and provides feedback to the suppliers, the 'real time strategy' that was previously stated is now used to rank the

suppliers and their bids. Because of the short time span the Event Manager helps and supports the Event Owner in this phase and updates the event into the next bid rounds. In the last bid round a decision is made to either conduct direct negotiations with the best ranked supplier(s) or evolve the event into an eRA. This decision is based on the 'real time strategy' and if the option of eRA is feasible.

After event: After the event all suppliers are informed about the outcome, if they are awarded the contract or not, and thanks are sent out for participation by the Event Owner. The Event Manager then closes the event.

Following the whole process the Event Coach is available. This is to ensure that if any problems arise they can handle it, and if not they have close contact with the ASP. By following multiple sourcing processes in the eSourcing platform the Event Coaches are continuously learning and use the knowledge to standardise and optimise the sourcing process within the platform.

The other perspective on the eSourcing process is the one shown in Figure 7.11. It displays the difference in sourcing using a traditional approach versus an eSourcing approach. Especially, it shows that the eSourcing approach does not differ particularly from the old process. Trelleborg Group has also understood several of the benefits in both process efficiency and time savings that eSourcing brings.

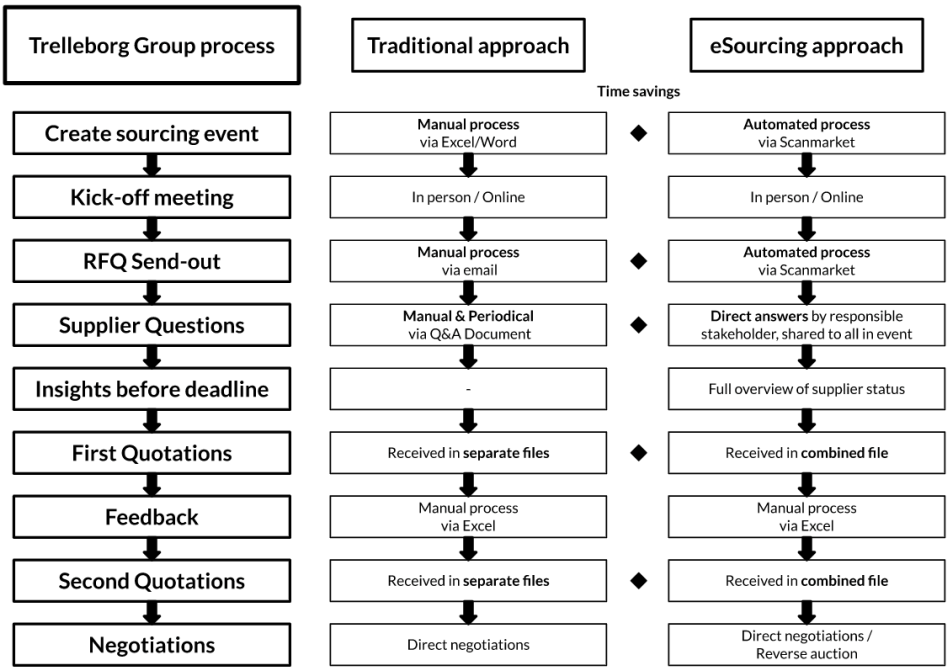

Figure 7.11. Trelleborg Group RFQ process, traditional compared to eSourcing approach.

7.3 The business unit 'Engineered Coated Fabrics'

Engineered Coated Fabrics (ECF) is a business unit which under the new business structure organisationally is located under the business area TIS. All products all have a clear nisch in being various textile fabrics which are functionally modified when coated by rubber and polymer materials. Due to a big spread in the possible applications for coated fabric solutions, ECF have had a strategic focus on the engineering technology and production processes over the years. As a result, well-established principles along with a high focus on process innovation are successfully applied in the approximately ten different coating, lamination and transfer coating production technologies which ECF utilise. The main production technologies and processes used are mixing, knife coating, calendering and rotocuring.

ECF's production footprint is spread over eight production sites in four countries, as seen in Table 7.2. Although all of the eight production sites are summarised under the business unit ECF, there is limited cooperation between the different sites in regards to sourcing and purchasing in general. Furthermore, the ECF Trelleborg site in the Swedish city of Trelleborg was the main research subject in the internal case. The part of the Trelleborg site which relates to ECF employs over 100 people including production staff in a 14.000 m^2 production facility, and even more when considering support back office functions located in Trelleborg Group headquarters.

Table 7.2. ECF production footprint.

Country	Local sites
Slovenia	Kranj; Ptui
Sweden	Trelleborg
United Kingdom	Nottingham
United States	Rutherfordton; New Haven; Monson; Slatersville

7.3.1 Product and customer segments

The ECF site in Trelleborg is producing fabrics which are sold as materials or components for industrial applications in Defense and Aerospace, Healthcare and Medical, Safety, Automotive and many other industries. The majority of these industries maintain complex and strict industry standards which require extensive certification procedures. From ECF's perspective, challenging the supplier structures which correspond to specific products often calls for supplier approval processes with long lead times of up to one to two years.

There are of course several customer segments which are not as specific in their bill of materials and thus have lesser requirements on ECF in regards to supplier certification. The relevant point is however that there is a big variance that must be taken into consideration when the category and supplier segmentation in regards to supplier approval complexity.

In addition, ECF has grown their product portfolio mainly through acquisitions and slight technical modifications of already existing product specifications. There is limited entirely new product innovation, and the general characteristics of the product portfolio is that it is relatively slow-moving. There are however still more than 2000 slightly different products in ECF's product portfolio, out of which more than 80% are customer unique products. These are sold to a customer base of approximately 1000 customers.

7.3.2 Local purchasing organisation

The operations organisation of ECF Sweden is illustrated in Figure 7.12. The local Operations and Supply Chain Manager is responsible for the general management of the Swedish ECF site in Trelleborg. In regards to purchasing, the site is represented by one Strategic Purchaser who reports directly to the Operations and Supply Chain Manager. The Strategic Purchaser is responsible for conducting both sourcing and procurement activities of direct as well as indirect material and service categories which do not fall under any of the central Lead Buyers or Country Coordinators.

The strategic purchaser further continuously analyse, categorise and oversee the relevant spend categories as well as their corresponding supplier relationships based on Trelleborg Group's version of the Kraljic Matrix.

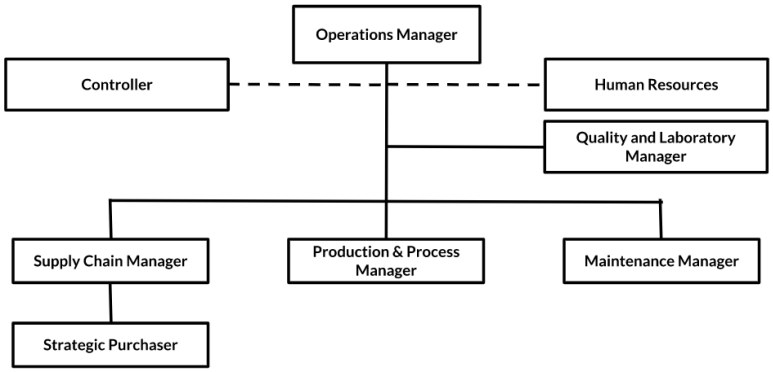

Figure 7.13. ECF Sweden's Operations organisation.

Most of Strategic Purchaser's activities are conducted in close contact with the Operations and Supply Chain Manager. The purchasing performance for ECF's key categories is in turn reported to TIS's BA Purchasing Director based on a set of three KPI's:

- *Dual sourcing:* Measured as "% of items with single sourcing". Target typically that 0% is single sourced.
- *Savings:* Measured as "% savings". Target is typically 5% annually for key categories.
- *Quality:* Measured as "% of total number of total order lines".

7.3.3 Purchasing Excellence milestones

The ECF site has, like all other sites operating under Trelleborg Group, developed its operating practices to adhere to the various Excellence programs. In regards to purchasing, a chronological set of PE milestones have been summarised in Figure 7.14. In general, the overall focus in purchasing strategy for the ECF site has lately been to increase the % of dual sourcing and improve the operations from a supply risk management and cost perspective. One of the main bottlenecks in this strategy is approving multiple suppliers.

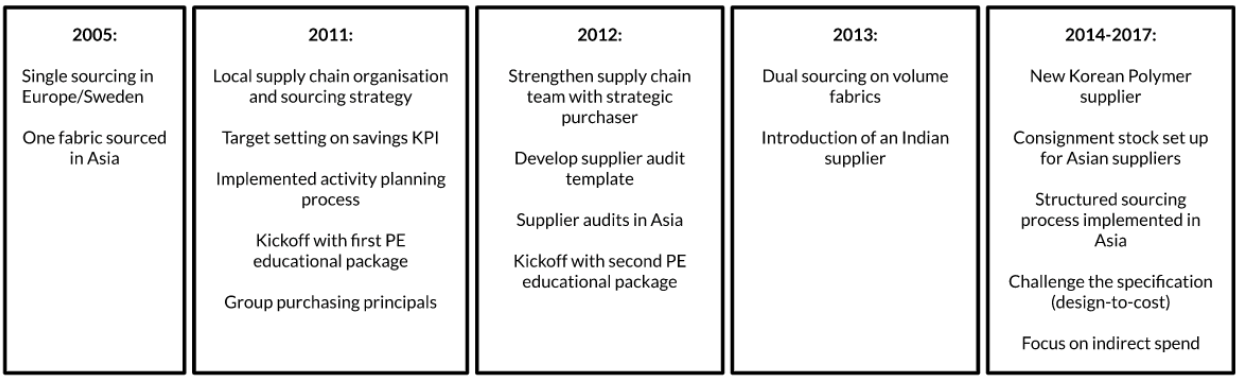

Figure 7.14. Purchasing Excellence milestones for ECF Trelleborg.

7.3.4 Spend and supplier categorisation logic

As previously stated, the main tool upon which supplier segmentation is conducted is a simplified and somewhat automatable version of the Kraljic Matrix. Trelleborg Group has in this Matrix defined the amount of suppliers on the X axis and the spend level on the Y axis, making it easier to work with the data in analytical spreadsheets in large scale. The spend data which is used as the basis for Kraljic categorisation is the spend distributed over the entire supplier base, on the format "spend per supplier". Apart from the spend data, an additional Kraljic categorisation partnership decision support has been defined to pinpoint the difficulty of obtaining supply from alternative sources, as depicted in Figure 7.15. It should be noted that although this decision support logic could be simplified with less steps, these are the steps upon which the partnership assessment has been automated in Trelleborg Group's spreadsheets.

The partnership decision support was implemented by the PE board less than a year ago, following an internal trend that too big parts of the supplier base were being segmented as partners simply due to their high spend levels combined with lack of approved alternative sources of supply. For the same reason Trelleborg Group further distinguished between two types of partnerships, partnerships driven by either *supply* or *value*. *Supply driven partners* were defined as the type of partnership being driven by large volumes or spend values rather than the collaborative co-creation of strategic values. *Value driven partners* were in turn defined as the type of partnership were defined by their strategic value impact for Trelleborg Group as a company and for the product per se.

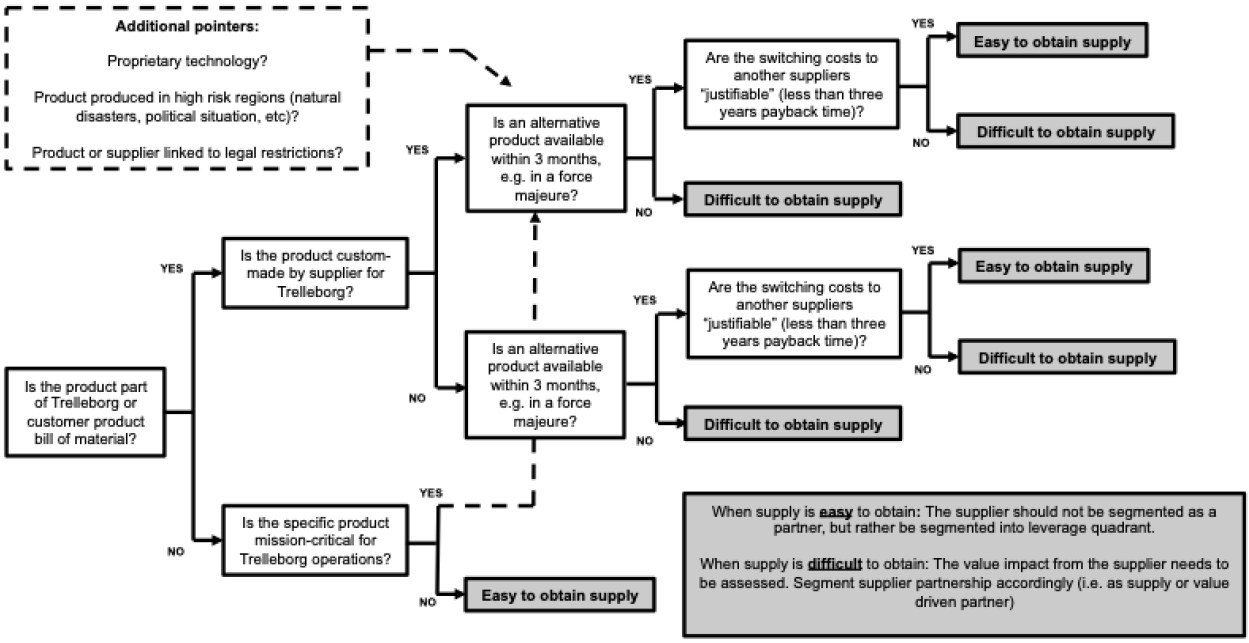

Figure 7.15. PE board's partnership decision support based on the ease of obtaining supply.

In short, the Kraljic segmentation in its entirety at ECF is conducted following a set of semi-automated steps in Excel. Firstly, every supplier spend data is sorted from highest to lowest spend values per supplier. Thereafter, the sorted list (spend per supplier) is divided in two, based on the 80/20 rule for the accumulated total spend.

The first 80%, containing the most important suppliers from a spend perspective, is reviewed regarding the ease of obtaining supply. This is done based on the partnership decision support in Figure 7.15. Based on the assessment, all suppliers are segmented into either the leverage or partnership quadrants. If segmented as a partner, the supplier is further assessed in regards to their value impact based on the value assessment questions in Figure 7.16. If the answers to one or many of the value impact assessing questions are yes, then the supplier should be defined as a *value driven partner*. However if all or most answers are no, then the supplier is defined as a *supply driven partner*. In other words, the supply driven partners are characterised by low market competition and supplier lock-in rather than the strategic co-creation of customer value.

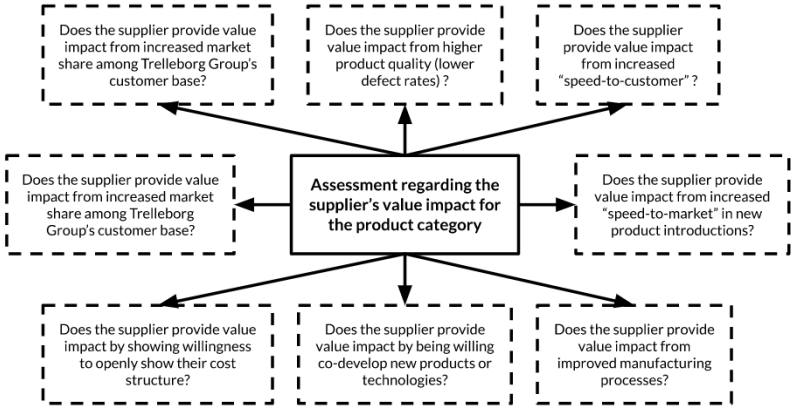

Figure 7.16. Additional assessment regarding the supplier's value impact.

The remaining 20%, consisting of the least important suppliers from a spend perspective, are then segmented as either "shop" or "manage risk" quadrants based on the amount of approved suppliers for the relevant sourcing categories. In general, the left column (leverage, shop) thus consists of sourcing categories where there are at least two approved suppliers per sourcing category.

7.3.5 Spend and supplier categorisation

Based on the segmentation methodology and decision logics described in the previous section, ECF have categorised their suppliers and the corresponding spend according to Table 7.3.

Table 7.3. ECF Trelleborg's spend and supplier categorisation.

ECF's total spend: **16,62M €** ECF's total number of suppliers: **277**				
Leverage	**Shop**	**Manage Risk**	**Value driven partner**	**Supply driven partner**
Suppliers: 35 Supplier share: 12,6% Spend: 12,605M € Spend share: 75,8%	Suppliers: 232 Supplier share: 83,8% Spend: 3.105M € Spend share: 18,7%	Suppliers: 5 Supplier share: 0,3% Spend: 0,054M € Spend share: 1,8%	Suppliers: 0 Supplier share: 0% Spend: 0 € Spend share: 0%	Suppliers: 5 Supplier share: 1,8% Spend: 0,856M € Spend share: 5,2%

Although the spend categorisation is conducted as a rather simplified Kraljic segmentation per supplier, ECF Trelleborg still maintains a relatively well defined category structure. In fact, 98% of the accumulated spend can be divided into the 65 categories in Table 7.4. The remaining 2% tail spend is not accounted for in the category structure. The categories marked by a star in Table 7.4 are categories which are managed centrally by the Lead Buyer and Country Coordinator organisations and will thus not be covered in either the additional spend and category analysis or the opportunity identifications of the following chapter.

Table 7.4. ECF Trelleborg's sourcing category structure.

Light Fabrics	NR*	ATH	Forklifts	Adhesive Chemicals 1
Rubber Chemicals*	MRO	Filler special	Insurance	Special Film 1
NBR*	Electrical Maintenance	Pension	Ventilation Maintenance	Adhesive Chemicals 2
PA Fabrics	Glass Fabrics	CR*	Company doctor	External Compound
CB*	PE Carrier	Plastic Film 1	Cleaning	Maintenance
Technical Cord Fabrics	EPDM*	Packaging	Special Fabric 4	Car Leasing*
Paper	Special Fabrics 2	Trading	Credit card	Clothing
SBR*	Process Oil	Pigments	Lego coating	Laboratory gas
Mechanical Maintenance	Internal freight allocation	Solvents	Electricity*	Rubber Chemical Special*
Plasticiser	Special Fabrics 3	PET Carrier	BR*	Clothing cleaning
CSM*	Consultants	NBR-PVC*	Cotton Fabrics	Cell phones*
Special Fabrics 1	Freight	Cord Fabrics	PC	Recruitment
White Fillers	Automation Services	Aramide Fabrics	Coffee Machines	Office supplies

8 Implications for Trelleborg Group

The two different research questions and their respective implications on the internal case is presented in this chapter. The appropriate choice of sourcing approach is adapted to the data gathered from ECF Trelleborg while the configuration of eRAs are general for the Trelleborg Group.

8.1 ECF Trelleborg's appropriate sourcing approaches

As previously stated in the cross-case analysis, eRFX is deemed to completely replace traditional RFx. This can be the case also for the entirety of Trelleborg Group, even though it comes down to organisational adoption throughout the decentralised organisation.

Regarding the applicability of eRAs, the current practices at ECF Trelleborg are not sufficient to support the question of when and where it can be used. First of all, one goes to market usually based on product or category specific demand rather than supplier specific demand. Thus category specific analysis and segmentation would prove more valuable than supplier specific analysis and segmentation. In an optimal scenario, both segmentation types would of course be available at all times through similar semi-automated practices as with ECF Trelleborg's supplier based Kraljic segmentation. Secondly, ECF Trelleborg's supplier based Kraljic segmentation puts big emphasis on spend per the current suppliers. There is a risk that some potential from the supply market analysis is overlooked, e.g. suppliers which have been initially scouted but not yet approved. Increasing the approved supplier base will prove necessary once assessing the applicability of eRAs, as it is a sourcing approach which requires a supplier base of at least 3 pre-qualified and approved suppliers. Thirdly, further work will in the future be needed by ECF Trelleborg in regards to how they can work cross-functionally in order to achieve complete comparability between suppliers bids on non-price attributes. For all of ECF Trelleborg's sourcing categories in Table 7.4 which are managed locally by ECF Trelleborg, an additional questionnaire was thus conducted to investigate the current organisational awareness regarding the three limiting factors above.

8.1.1 Additional spend and category analysis questionnaire

The goal behind the questionnaire was to assess the current awareness, but also to identify the applicability and opportunities for future eRFx and eRA events once the eSourcing initiative is to be implemented on a broader front. Also the primary barriers which prohibited ECF Trelleborg from conducting competitive supply market exercises needed to be better understood. The questionnaire was conducted for all of ECF Trelleborg's sourcing categories, based on the questions posed in Figure 8.1.

Prior to conducting the questionnaire, the spend data had to be redistributed from its supplier based format to a category based format. To do this, each of the categories in Table 7.4 were assigned their represented spend and suppliers (and thus also the corresponding supplier based Kraljic quadrants). As a result of this methodology each category could be assigned to more than one Kraljic quadrant, since the segmentation was on supplier level and each category could consist of several specifications. However, the category based format still gave an indication of the following data points:

- Spend per category
- Kraljic quadrants represented per category
- Amount of suppliers represented in each category
- Specific suppliers represented in each category

A quick remark in regards to Table 7.4 is that if the category structure were initially done per sourcing category rather than per supplier, consolidations could more easily be made. Especially in regards to MRO where e.g. the electrical, ventilation and mechanical categories

maintenance could have been consolidated either as general maintenance or even more broadly as MRO. This type of category bundling enlarges the scope when analysing the supply market and in turn increases negotiation leverage in case suppliers with broad enough capabilities are found.

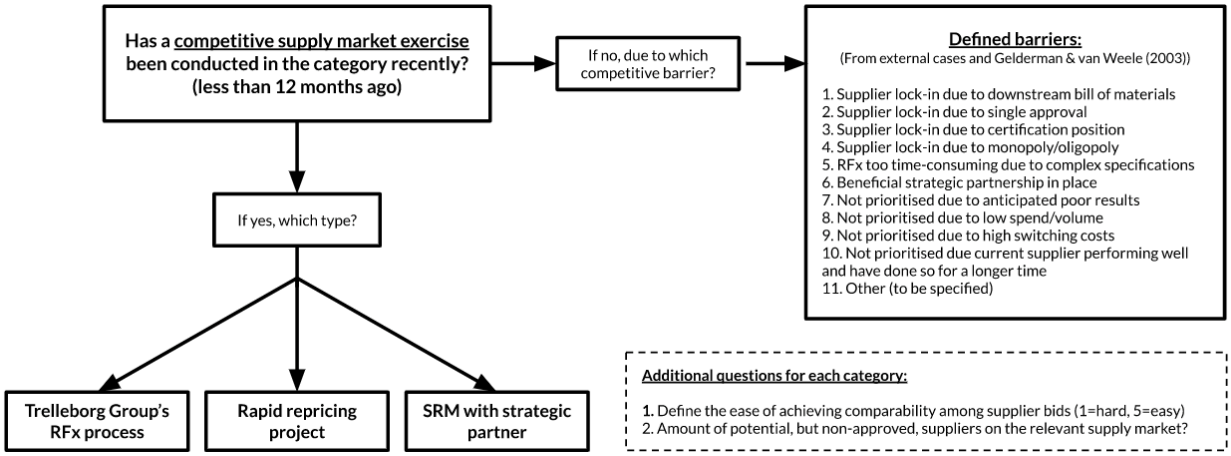

Figure 8.1. Scope of additional category based questionnaire sent to ECF Trelleborg.

Note that conducting SRM activities with a strategic partner should not be defined as a competitive supply market exercise, based on the reasoning from earlier chapters. However, on directive from ECF Trelleborg it was better to be included. The definition of SRM activities in this regard typically meant annual price negotiations with the incumbent strategic partner. The additional questions in the bottom right corner of Figure 8.1 was posed mainly with the aim of analysing the applicability of conducting eRAs, but also proved to be important when defining the possibility to to overcome certain competitive barriers.

8.1.2 Identified category actions and opportunities

Based on the newly acquired category insights from the questionnaire as well as the decision model in Figure 6.3, opportunities for competitive sourcing approaches were identified and corresponding courses of action recommended in order to achieve these. The opportunity identification and recommended actions followed the decision logic in Figure 8.2. As part of this opportunity identification, a series of barriers which had prohibited competitive supply market exercises were come across throughout ECF Trelleborg's category structure, as summarised in Table 8.1.

An immediate insight is how well represented supplier approval issues are, especially in regard to its share of spend. In the wake of this insight, it should be noted that the process integration focused focused discipline of eSourcing partly focused these type of issues by striving to introduce new and improved cross-functional interfaces within the eSourcing platform between e.g. R&D, production and the sourcing professionals.

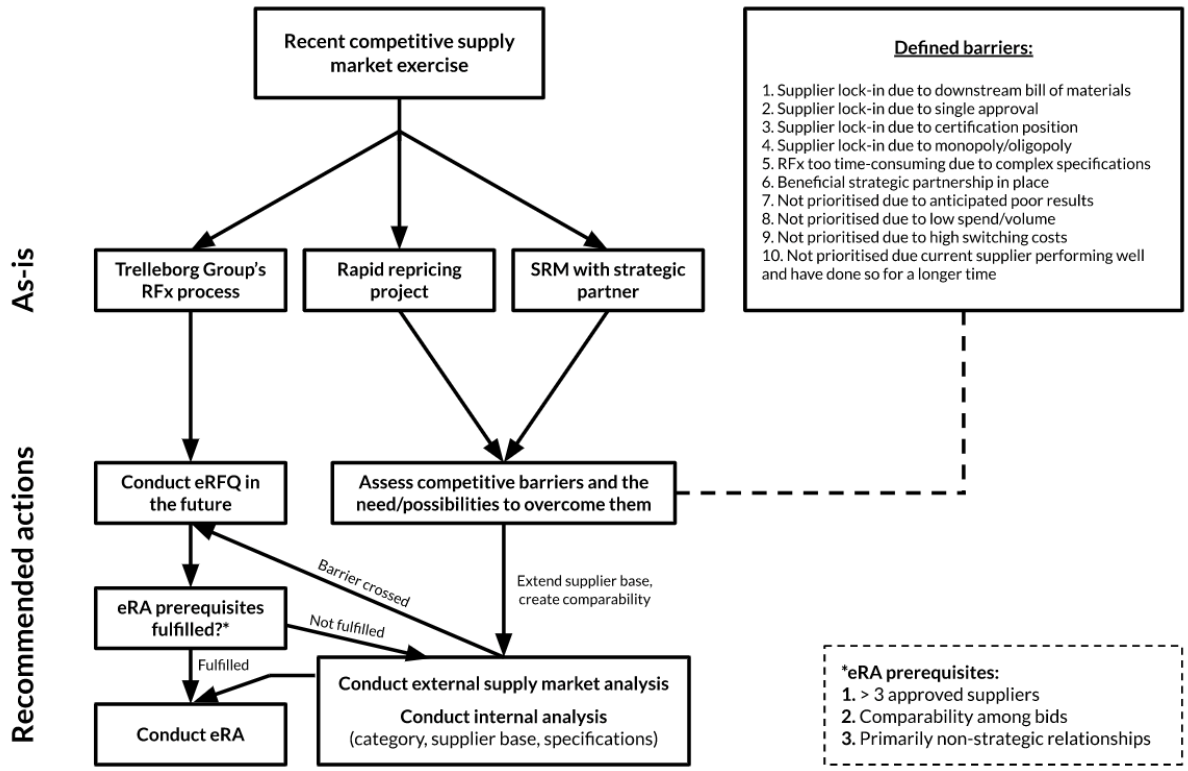

Figure 8.2. Opportunity identification logics and recommended category actions.

Table 8.1. Summary of identified competitive barriers at ECF Trelleborg.

Competitive barrier	Represented categories	Share of total spend
Supplier lock-in due to single approval	6	4,12%
Supplier lock-in due to monopoly/oligopoly	4	1,86%
Supplier lock-in due to certification/patent position	4	1,01%
Not prioritised due to low spend/volume	1	0,35%
Not prioritised due to high switching costs	5	0,44%
Not prioritised due to anticipated poor results	1	0,44%
Beneficial strategic partnership in place	1	0,6%

Table 8.2 further presents a summary of the recommended sourcing approaches for ECF Trelleborg's defined category structure, based on category and supply market characteristics of each category. The opportunity identification was done on category level, but these category based recommendations along with the characteristics leading to these recommendations are not fully disclosed in the study. Such disclosure would risk exposing ECF Trelleborg's strategically sensitive category and supplier information. For several of the future recommended sourcing approaches to be viable, ECF Trelleborg will need to conduct additional supplier approvals. The recommended sourcing approaches do however, based on category and supply market characteristics, provide information about the potential for improved supply market competition which an eSourcing platform will offer ECF Trelleborg.

Table 8.2. Recommended sourcing approaches for ECF Trelleborg's category structure.

Recommended future sourcing approach	Represented categories	Share of total spend
Direct negotiations (No eRFx)	23	13,5%
eRFx	18	34%
eRFx + eRA	19	28,5%
N/A (outside scope because sourcing consolidated on group level)	9	21,7%
N/A (other reasons)	5	2,3%

Based on the required additional spend and category based analysis above, it is deemed wise for Trelleborg Group to assess the need of extending their analytic practices throughout their sourcing organisation. Such extensions partly regard improved category structures on local level, as well as further category structural improvements on central level to identify additional potential synergies between BUs as well as BAs. But it also regards the need for further category based Kraljic's segmentations which are not initially made on a supplier level. Both category as well as supplier based Kraljic segmentations are important tools to get a good idea of category and supply market characteristics. Both of which are critical when identifying the appropriate sourcing approach for any given sourcing situation. Additional analytic practices which should also be included on a sourcing project level, are the PESTEL analysis in Table 3.4 and the reversed SWOT analysis in Figure 3.10.

8.2 Finding the appropriate eRA program configuration

The Group Purchasing function has an ambition of implementing eSourcing together with eRAs for the entirety of Trelleborg Group. Therefore the implications in this chapter will be very limited for ECF Trelleborg and more focused on the general company-wide eRA program than for a specific BU.

Based on the external case insights it is evident that Trelleborg Group needs to define their scope and strategy in terms of how eRAs are to be used. From the internal case it is clear that Trelleborg Group's eSourcing initiative is characterised by the increased supply market competition focused discipline of eSourcing utilisation.

The configuration model for eRA program success presented in Chapter 6.2.4 (displayed again in Figure 8.3) emphasises the importance of lifting the focus from how to configure single eRA events to how an entire eRA program at the company is to be structured. The need for this more holistic perspective of a company-wide eRA program is highly relevant for Trelleborg Group, given their very event focused definitions highlighted in Figures 7.9 and 7.10. In other words, Trelleborg Group needs to further understand how to approach the three different eRA configuration tiers in order to truly achieve the goals behind their eSourcing and eRA implementation initiative.

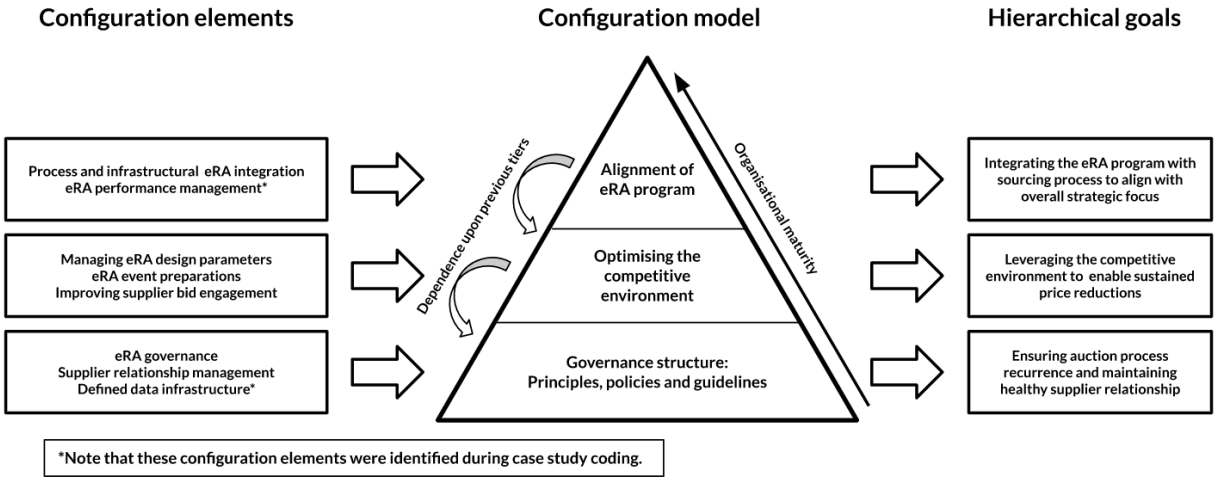

Figure 8.3. Configuration model for eRA program success.

Configuration of the first tier:
In regards to configuring the first tier, a governing structure with ethical principles, policies and guidelines on how to conduct eRAs needs to be put in place. A standardised and company-wide configuration of the governing structure is imperative, independent of if Trelleborg Group's eSourcing goal is increased leverage of supply market competition and frequency and volume of sourcing events. The reasoning behind the necessity of such structural standardisation follows their need for a standardised sourcing process throughout the company which a supplier can relate to, whether they are dealing with Trelleborg Group through a production plant in Italy or centrally in Sweden. The standardisation is further aimed at decreasing the difficulty of achieving internal organisational compliance throughout the company, as the organisational learning and understanding will be built around this governing structure. Examples of how Trelleborg Group could define their principles, policies and guidelines in regards to this governance structure is as follows:

- *Buyer commitment policy:* e.g. "Trelleborg Group will, per internal policy, host eRA events under full buyer commitment. Only under exceptional circumstances are the eRA outcome to be waived".
- *Supplier participation principle:* e.g. "In order to ensure fair supplier competition and to simplify supplier comparisons internally, Trelleborg Group will per principle not invite any non-approved suppliers to participate in eRA events".
- *Bid disclosure:* e.g. "With respect for the sensitivity of our suppliers' cost structures, Trelleborg Group will only disclose rank or traffic light feedback in hosted eRA events".
- *Ethical codes of conduct:* e.g. "With respect for all participating stakeholders, invited suppliers are expected to follow the following set of ethical guidelines...".
- *SRM based eRA guidelines:* e.g. "Sourcing professionals at Trelleborg Group are to carefully assess the relationship characteristics in any strategic partnerships before conducting eRAs. If the partnership is based specifically on its exclusive collaborative value adding characteristics, eRAs are not recommended. In the case of a supply-based strategic partnership, the price competitiveness of the partnership could be subject to a reality check by conducting eRAs."

The data infrastructure which is to support eRA (and general eSourcing) performance management is another important component of the first configuration tier which is to be set up initially. An important first remark in regards to this infrastructure is that Trelleborg Group needs to assess the user structure inside their Scanmarket license. It is important to consider the benefits of maintaining one personal user account per sourcing professional, in terms of tracking individual eSourcing compliance. This could prove beneficial, especially in the light of their initially identified internal resistance to eSourcing utilisation. Oftentimes one single successful eRA event could pay off the entire increased ASP fee. Thus it is important to understand the simplicity and importance of infrastructural modifications in order to achieve organisational compliance as well as its linkages to eSourcing license cost payback.

The importance of maintaining well structured eSourcing master-data comes into play here as well, as opportunity for conducting eRAs over time to a large degree will come down to the assessment if suppliers are ready to be squeezed again. If not maintaining such supplier based overview through supplier master-data inside the eSourcing platform, risks are that price reduction opportunities will be missed or supplier relationships will be damaged based on too intensive price reduction initiatives.

Another aspect of the data infrastructure, relevant for Trelleborg Group, regards upon which category structure their subsidiaries will try to identify opportunities for conducting eRAs. As previously mentioned an example is that of the MRO category at ECF Trelleborg which could be a good candidate for a very attractive eRAs based on aggregated spend. This was especially the case in regards to the maintenance categories being spread over different maintenance types. Meanwhile a consolidated sourcing process with increased leverage could be made possible with improved category structure, at least an altered category structure

would allow analysis of whether supplier capabilities would allow it. This once again highlights Trelleborg Group's need for further category based analysis on a continuous basis as well as throughout each and every sourcing process. As an example, Figure 7.5 highlighted Trelleborg Group's sourcing process on a high level in which its third step states conduct supply market analysis. The process structure, as well as the 16 week RFQ process in Figure 7.7, however leave a looming absence of corresponding internal category analysis. This will potentially become a problem when trying to identify opportunities to conduct eRAs on a broader scale throughout the organisation.

Configuration of the second tier:
When configuring the second tier, the focus is mainly on optimising the competitive environment which to a large extent highlights eRA configuration on an event level. But the real question here is to ask how will Trelleborg Group as a globally decentralised company realise the biggest sustained price reductions through eRA utilisation. It is most likely not by deploying the most advanced eRA designs and lotting/bundling strategies, but rather keeping the eRA design simple to ensure organisational understanding of eRAs and adoption of its use. Simple design typically means only auctioning on price award criteria, using simple types such as English auction with limited bid disclosure.

In regards to event preparations and given the novelty nature of eRAs at Trelleborg Group, extensive internal and external training programs should be deployed. Including the first embryo of what will most likely become an internal eSourcing consulting team could be a good idea already at this point. This will help develop their capabilities in regards to overcoming internal resistance and gather material for solving frequently occurring problems. Running test auctions prior to every eRA event is another important point which is worth the extra preparations, as one excluded supplier due to technical difficulties can mean the difference of several percent on the sourcing contract.

Furthermore, event preparations means that all invited suppliers need to be properly pre-qualified (based on the defined participation principles) and the specification needs to be very clearly defined. A general recommendation in this regard is that Trelleborg Group sets as standard practice that all eRA events are prepared by running at least one round of eRFQ in order to achieve supplier bid comparability.

In regards to general improvement of supplier bid engagement in each eRA event, Trelleborg Group should not seek to conduct eRAs only for very big contract values, as suggested by traditional as well as contemporary eRA literature. One external case company even suggested that they had done successful eRAs for contract values of down to 15.000 SEK. Each event does however require a minimum of 3 competitive suppliers. That number can then increase up until the point where the trade-off between supplier training preparations and anticipated improvements in supplier bid engagement become non-beneficial.

For companies adopting the increased supply market competition focused eSourcing discipline, there is a general rule of thumb in regards to initial eRA program configuration. This is that actually getting started with and gathering organisational experience from eRA utilisation can be considered equally important as initially finding the optimal process structure and achieving complete alignment between eRA utilisation and business strategy. Minor tweaks in the bottom tier can then be undertaken further into implementation if deemed needed in order to achieve strategic alignment. Once the organisation has matured in its eRA utilisation and best practices are identified, it can be suitable to reconfigure the commonly defined sourcing process to align it with the configuration of the eRA program, and vice versa. A good organisational fit for Trelleborg Group particularly in regards to the pre- and post-auction process balance is what is considered to require such organisational maturity.

A final remark, based on the defined goals of increasing transparency and visibility, it is a general recommendation that all sourcing activities are to be initiated as projects inside the

eSourcing platform. This should be done independent on if a competitive supply market exercise is to be conducted or not. The general idea behind this principle is that it will over time leave a sourcing trace for each individual, BU or BA which in turn can be monitored and evaluated centrally.

Configuration of the third tier:
The third and final tier can be considered the hardest for Trelleborg Group to configure and which will require the most organisational eRA maturity.

Based on the defined goal of drastically increasing both the volume and frequency of when competitive market exercises are conducted, Trelleborg Group should initially focus on the first and second tiers. Focus on the third tier should come mainly once organisational eRA maturity has been achieved, in terms of capabilities and general experience.

Once it is relevant, this tier refers to process integration and strategic alignment. Over time this will regard issues such as trade-offs between strategically prioritising supplier collaborations or price competitiveness. It could also regard how to approach the general process improvement potential which is enabled by a few eSourcing ASPs through improved cross-functional interfaces. Such cross-functional interfaces refer to e.g. purchasing and R&D for the specification management process or for the supplier approval process.

An important step, which needs to be dealt with initially, is to define a structured outline for how eRA performance management is to be carried out. Enough coverage of such an outline is presented under configuration of the first tier. It can be a good idea to initiate structured eRA performance management already when getting organisational eRA experience throughout the second tier, even though the “final destination” might be unknown.

Regarding the organisational part of the infrastructure integration, Trelleborg Group is already well underway with how the different eSourcing platform user types in Figure 52 have been defined. An important step in regards to such organisational eSourcing integration is to identify where to deploy an internal eSourcing consultant team. Such deployment is preferably done centrally and it could thus it could be a good idea to find synergies between the Lead Buyer and Country Coordinator team and what would be an internal eSourcing consultant team.

9 Conclusions

In this chapter the key findings regarding the two research questions are summarised and presented, then topics for future research are proposed.

9.1 Key findings

The study has mainly focused on updating prior knowledge as most literature on the subject of eSourcing is at least a decade old. The findings of the study were to a big extent consistent with previous theory. But as digitalisation has developed immensely, the eSourcing platforms of today are often called source-to-contract platforms and are noticeably a lot more sophisticated. Sophistication has improved in two key areas: *the digital sourcing process* and the *leverage of supply market competition*. Some ASPs can offer a wide array of digital process representations including new cross-functional interfaces, whereas other ASPs seem to focus on various competitive sourcing events to optimise supplier bidding procedures.

The increased process sophistication has enabled considerable sourcing process reconfigurations in the cases when they are desirable. We defined this type of eSourcing utilisation as the *process integration focused discipline*, which is characterised by the strive for cross-functionality and general sourcing process improvements. Meanwhile the increased sophistication in regards to how well the supply market competition can be leveraged has been enabled by structured combinations of eRFx and eRAs inside the eSourcing platform in an efficient, time-saving manner. The result is that volume as well as frequency of competitive supply market exercises typically increase. We defined this type eSourcing utilisation as the *supply market competition focused discipline*, which in turn is characterised by the strive to optimise the competitive settings among known category structures and supplier bases. It is an eSourcing discipline which requires a lot of iterative external supply market analysis and internal category analysis.

9.1.1 Aspects of choosing sourcing approach

> ***First Research Question (RQ1):*** *Which are the aspects and situational factors that influence the choice among available sourcing approaches within and outside an eSourcing platform?*

The different steps of a sourcing process have been widely discussed in literature but comparisons in applicability and suitability of various sourcing approaches has to our knowledge not been explicitly researched. This is especially true when considering how to potentially combine traditional F2F or email-based sourcing approaches with newer, digital sourcing approaches such as eRFx and eRA.

In Figure 9.1 our model for determining which sourcing approach to choose is presented. The model starts with the assumption that a supply market analysis has been performed in the respective product category and asks if the category can be subject to a competitive supply market exercise. The barriers to perform such an exercise are listed as:

- *Supplier lock-in*: In product categories where suppliers enjoy patent positions or are specified in downstream bills of materials they are locked in and cannot be changed. Strategic partnerships where they will not be subject to competition are locked-in.
- *Insufficient supplier base*: If the market is characterised by monopoly/oligopoly the supplier base oftentimes can be insufficient for competitive supply market exercises.
- *Internal resources*: A common reason for not conducting competitive supply market exercises is that the internal resources are not enough and that the category will not be prioritised. This is especially true for low value categories.
- *Specification complexities*: Certain products are difficult to specify, e.g. consultancy services or products with a high brand value, and therefore are hard to change.

If any of these barriers exist the purchaser is forced to opt for direct negotiation strategies. Mitigation strategies for these situations are to conduct more thorough analysis of either the supply market to find new suppliers or internal analysis to understand if the specifications could be changed and therefore a new supplier base could be unlocked.

But if the product category is free of any barrier the choice would be to conduct a competitive supply market exercise. From our study it has been found that a traditional email based RFx can never be preferred to an eRFx using an eSourcing platform. This is due to the fact that the eRFx possesses the exact same functionalities as traditional email based RFx processes but appreciate several additional benefits e.g. better data management, improved cross-functional workflow and process time savings. After conducting an eRFx event it can be transformed into an eRFQ, if not the initial setting. With all bids received the purchaser can choose to either continue with direct negotiations using the eRFQ results or, if applicable, choose to create an eRA. From the study it was understood that an eRA must always be preceded by an eRFQ and have a minimum of three approved suppliers with bids that are comparable, and strategic suppliers should not carelessly be invited to an eRA.

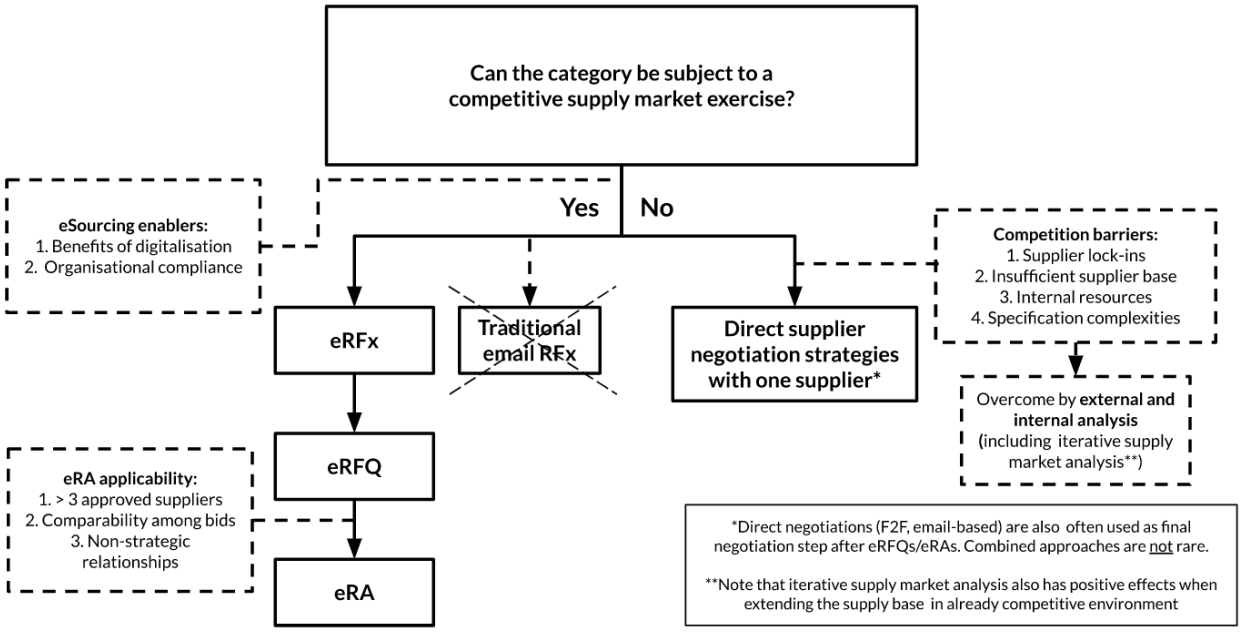

Figure 9.1. Decision model for choosing among available sourcing approaches.

9.1.2 Configuration elements of an eRA

> ***Second Research Question (RQ2):*** *What are the configuration elements which affect the success of utilising electronic reverse auctions?*

The novelty in the configurations of eRAs was not in the knowledge of which configuration elements that existed but in the hierarchical categorisation of them into tiers. It was also due to the understanding of the difference of importance between them and which should be configured first and which should be configured as the organisation grows more mature in their eRA program. An additional novelty factor for this study was how it focuses the configuration of an entire eRA program, rather than the configuration of single eRA events. A model of the configuration elements were created and is presented in Figure 9.2, in this model three tiers of configuration elements exist:

- *1st tier*: Governance structure: Principles, policies and guidelines.
- *2nd tier:* Optimising the competitive environment.
- *3rd tier:* Alignment of eRA program with sourcing strategy and business strategy.

A company intending to implement an eRA program into their sourcing processes should first focus on the first tier, then the second and lastly the third in order to gain the most success out of the eRAs.

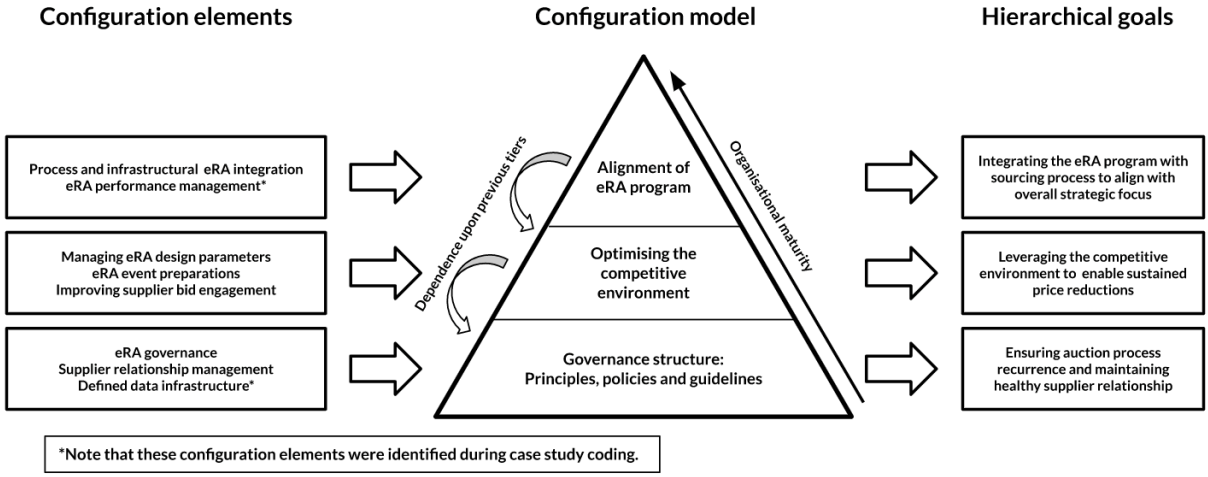

Figure 9.2. Classification of configuration elements.

The first tier of configuration elements are the governance structure. These are the most important configuration element and their aim is to ensure auction process recurrence and healthy supplier relationships. It was found imperative that the purchasing organisation has a foundation on which to adhere to. The most obvious was the sound ethical guidelines and the relationship standpoints, but it was also found that a determined data infrastructure was needed in order to govern and maintain a functioning eRA program. Having configured these elements and complying to the principles will make sure that an eRA will not fail and damage the brand of the organisation but it will neither drive success as measured in cost reductions.

The second tier of configuration elements organises the competitive environment. It entails the preparations and design of an eRA event and also how to improve the bid engagement of participating suppliers. If these configuration elements are properly addressed the outcome will be a highly competitive eRA with good chances of finding the true market price. Any first tier configuration element would trounce a competitive environment configuration in the event of contradictions, as the governance principles are supposed to govern the competitive environment. In regards to expected eRA outcome, cost reductions are probable to observe when optimising the competitive environment. However, noticeable cost reductions are primarily seen in first strike auctions whereas eRA benefits from recurrent events are likely to flatten out as the price should not drop below the true market price.

The last tier of configuration elements are the integration of eRA into the sourcing process and strategic alignment within the eRA program. These configuration elements demand a clear mature understanding of the eRA purpose and its function within the sourcing process. Measuring and managing the performance of the eRA should be done in accordance with strategies set up for not only the eRA program but the whole sourcing process and the business in its entirety. An individual eRA could prove successful without having these elements configured, but if the ambition is to have a successful eRA program with sustained positive results, the organisation must understand its organisational strategies in order to align the eRA program and integrate it with the current sourcing processes. Initial eRAs at a company could be performed successfully without a process and system integration having several good first strike auctions but the success would not be lasting in the long term.

9.2 Further research

The most interesting part of this study was potentially how the case companies found innovative ways of utilising eRAs and how these could change their sourcing processes. If given additional time these success stories would have been very interesting to investigate further and understand how the opportunity was found and what actions were needed to change the process. The first proposed topic of future research is therefore on innovative reengineering of sourcing processes.

(1) Innovative reengineering of sourcing processes with the use of eSourcing, opportunity identification and implementation changes.

A perspective that has been overlooked in this study is the supplier perspective of eSourcing applications. Does these new platforms prove beneficial for both parties or are the benefits purely obtained by the buyer. There were risks stated in literature of potential damage in relationships and from the internal case voices of concern regarding the field were raised. But the study could not find any clear examples of buyer-supplier relationships improving or deteriorating with the implementation of eSourcing. The second proposed topic is therefore.

(2) How is the buyer-supplier relationship affected by the introduction of eSourcing and the suppliers perspective of the introduction of eSourcing.

The last proposed topic of further research is regarding the novel digital technologies in RPA, AI, machine learning, cognitive agents, natural language processing, etc. These technologies were proposed by the large management consulting firms as the frontier of digital sourcing. We did not get in contact with any company using this and it would be very interesting to get further knowledge in how these technologies are practically adopted in sourcing organisations. If possible to find a case company having implemented such technologies, an in-depth analysis of the benefits gained and the impact the technologies has on the sourcing process would most certainly prove very useful.

(3) How does the implementation of novel digital technologies impact the sourcing processes and what benefits are expected to be gained.

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Appendix

Appendix A - Case segmentation process

Table A1. Reflections of each potential case during segmentation process.

No	Industry	Product(s)	Case company representative	Case segmentation insights	Status
1	Manufacturing	Industrial vacuum cleaners, etc	Transformation & Innovation Lead/e-Sourcing Specialist	Talked to the central eSourcing solution expert who is responsible for the SAP Ariba rollout. They have been using eSourcing for about 2 years so far. They are mainly doing supplier approvals and certificate collection cross-business areas with full visibility in both processes through their eSourcing platform. They had not come too far on eRAs, but they had started the implementation. The eSourcing solution expert definitely knew how to talk about the logical reasoning behind the tool and gave the impression eRAs could work for all types of categories, but that it came down to the preparatory work done. Invited to the case study mainly due to insights regarding supplier approval and certification processes.	Invited; case participant
2	Manufacturing	Vehicle cranes and forklifts	Global Category Director and Head of Services Sourcing	Talked to the Sourcing Director of Services. The company is using Ivalua. Explained that they specified their needs in regards to eSourcing in 2015 and went live with the system and its connections to other business systems (mainly master supplier master-data which is sent from Ivalua to other systems) in 2017 in Finland. Specified that they use both eRAs and eRFx through the eSourcing platform.	Invited; case participant
3	Agriculture; Food industry; Live stock feed; Machinery	Various brands related to agriculture and grain based food, etc	Head of Procurement	Talked to the Head of Procurement for indirect materials on group level who is also responsible for their eSourcing initiative. Except for the eSourcing responsible role being head of procurement, They are using four internal consultants who help in their eSourcing programme. They have prepared by getting insights into WHAT they are buying (category management) rather than just WHO they are buying from (supplier management). This preparation derives from how numbers are reported and what category overview has been created (comparability between BAs). They have a mix of central and local decision-making in their sourcing, some indirect categories are cross-company managed, others are company managed (local). Have worked a lot with finding a good setup of buyer commitment.	Invited; case participant
4	Construction, Civil engineering	Road surfaces, buildings, civil engineering projects	Chief Procurement Officer; Manager of Digital Purchasing Systems	Stated that they use a combination of eSourcing and eRA with e-catalogue. The use of eRA is quite concentrated in indirect materials. Their way of managing purchasing strategy is a big degree of flexible frame agreements for direct material, and standardised frame agreements for indirect material.	Invited; case participant
5	Manufacturing	Bearings, seals and industrial lubrication solutions, etc	Purchasing Director, Indirect Materials and Services; Group Purchasing Strategy & Business Transformation Director	Stated that they implemented eSourcing already in 2012. They use SAP Ariba for both indirect and direct materials and services. For more complex sourcing situations such as logistics and transport services they use TradeExtension (lately part of Coupa) which they consider to be better for scenario planning and optimisation. Today ERP data from approximately 50 ERP systems are being "washed" to get an overview of spend and other category related data on central level. eSourcing was first implemented on indirect materials, but was quickly moved to direct materials as well when they understood that it gave a much better control of numbers and general sourcing data. Found it valuable that they could follow price development per category also for direct spend which speeded up the overall eSourcing implementation. Told me to include both him as well as their Group Purchasing Strategy & Business Transformation Director, who is also the one responsible for the eSourcing systems. Together they have held courses in category management and digital sourcing processes at Handelshögskolan and could provide the powerpoints if we wanted and needed.	Invited; case participant
6	Manufacturing	Entrance, safety and lock systems.	Global Sourcing Director	They have the roles category managers and operational purchasers. Both roles are involved with their Scanmarket license. They have not really rolled out eRFx, but they are using eRA extensively for both indirect and direct material. They do about 150 eRAs per year at entrance systems. Examples of eRAs they do are for steel components and for electronics. They want to participate in the study. Our contact person was to invite the indirect purchasing director as well who is more familiar with the eSourcing practices. If we need more details we could set up a meeting with some of their mexican units. They are also conducting audits and supplier approval through their eSourcing platform as well.	Invited; case participant
7	Manufacturing	Rock excavation equipment	Vice President Purchasing	Have mostly spent resources on implementing good category management practices and to get a good overview of purchasing spend. Their products are technically driven by nature, not so much commodity characteristics. Their history is that their respective production sites have run their own procurement up until recently. Now they are working with category managers, but in close collaboration with local stakeholders. They often find themselves in sourcing situations where only a handful live up to their specifications. They have had a focus to get central control of spend, but also to increase the local capability regarding TCO and SRM. Today their category management has a central-local symbiosis, where cross-BA negotiation teams are set together for bigger negotiations. Local stakeholders have a mandate to influence the decision-making and central stakeholders are coordinating - the result is a half central decision-making in their purchasing processes. They have used Scandinavian purchasing group to drive education and consultation regarding purchasing and category management. It has taken 5 years (including change of ERP system during that time) to get good control of their category spend. They realise the savings locally, so it has been important to get local stakeholders onboard on the category management practices. They have worked approximately 12 years with improving their supplier approval process, mainly touchpoints R&D and purchasing, functional specification practices and to give suppliers the room to prove that they can deliver on such functional specifications. They have also set up routines for how to give R&D the room to perform adequate quality testing etc. Interesting viewpoint, but do not qualify for the case as they are not using eSourcing and/or eRA.	Not invited
8	Construction, Civil engineering	Road surfaces, buildings and other civil	Category Manager	Told me that he knows that they have worked with it before, but that it has been phased out due to loss of urgency. He thought this was due to the company being very decentralised and that their construction projects need to use complex specifications in	Not invited

		engineering projects		their purchasing. Thus it is hard for them to use eRAs and eRFx. He did not know if it was used for other categories than direct materials (that he was category manager for). Their general strategy is to have central frame agreements, whereas for larger projects they are using "mini RFQs" on project level with pre-approved suppliers. Follow-up email sent, but no answer.	
9	Manufacturing	Construction materials	Purchasing Director	They are indeed using both eSourcing and eRA on both direct and indirect categories. However, our contact did not have time to participate in our study due to hectic schedule.	Invited; declined
10	Manufacturing	Heat transfer equipment and services	Vice President Operations & Sourcing	Talked to VP Sourcing. They use Scanmarket, but have no standardised process for how they work with sourcing. Some categories are centrally sourced, while others are sourced by operational strategic purchasers on sites with full autonomy regarding sourcing decisions. It is often personal analysis that guides the choice of sourcing approach. There was great hype about eSourcing at the company early on, but it died out a few years ago. Now they are working actively to keep eSourcing knowledge alive, and have defined a set of goals to get the initiative going again. They try to conduct 2-3 eRAs per category and year. They have a lot of new products, so administratively they get big benefits from using their eSourcing platform.	Invited; no answer.
11	Manufacturing	Sports carriers and equipment	Vice President, Global Purchasing	Are not using eSourcing at all. Passed on this case as it is not relevant for the case study.	Not invited
12	Manufacturing	Appliances	VP Global Purchasing, Indirect Materials & Logistics	They have been doing eSourcing for 1.5 years, so they are very early in their implementation. They are not using eRA, at least not in indirect categories. Referred me to their responsible person for the SAP Ariba system. System responsible said they currently have the capability in their Ariba system to use eRFx and eRA, but they haven't gotten to implement it yet. Planning to implement it within the next 2 years. Passing on this case.	Not invited
13	Manufacturing	Hygiene products	Sourcing Excellence Manager	They are working with eSourcing to some extent but not clear on how and where. Not following up on contact, passing on this case.	Not invited
14	Manufacturing	Paper and wooden products	President, Sourcing & Logistics	They are working with eRAs for their transport sourcing processes. Are using eSourcing in a limited way on indirect material. Have a set of eSourcing systems, but feel that they do not have the full functionality that they require for their sourcing processes. Stated that creativity of the negotiation is restricted by the eSourcing interface and that suppliers are not given enough room to deliver on complex specifications in a creative enough way in certain situations. Also stated his impression was that eSouring worked much better in a recessive market, as too much competition in sourcing situations can give repercussions for the buyer in growing markets. Passing on this case.	Not invited
15	Manufacturing	Rock processing equipment	Sourcing Director	Talked to sourcing director of crush and sorting (within BA mining). They use Synertrade, partly eRFx on direct materials and no auctions. Nothing on indirect materials. Stated that they had not come far with eSourcing setup and thus we passed on this case even though it was an interesting phone call.	Not invited
16	Chemical manufacturing	Specialty chemicals	Vice President Procurement	Are not using eSourcing at all as it does not fit their categories of purchasing. Are looking at implementing only a contract management module. We passed on this case.	Not invited
17	Manufacturing	Ventilation and drainage systems	Sourcing Director - Steel Group Sourcing	They did not use this type of system, as they almost only negotiated with steel plants throughout the world, and considered eSourcing to be unsuited for their sourcing processes. Passed on this case.	Not invited
18	Manufacturing	Windows and other house construction material	Group VP Purchasing	We were told they do not use these types of systems due to their very decentralised organisational structure with more than 28 business units globally. We passed on this case.	Not invited
19	Manufacturing	Specialised steels for construction and manufacturing industry	Group Sourcing Director	They did not use these types of systems, as they considered eSourcing was unsuited for their sourcing processes. Passed on this case.	Not invited
20	Manufacturing	Pumps and pressure devices	Purchase Director Global - Mechanical Products	Called, no answer.	Not invited
21	Food and dairy	Food products	Procurement Director - Global Supply Chain	Called and left voicemail per telephone, no answer.	Not invited
22	Manufacturing	Packaging material	Group Director Supply Chain & Procurement	Called, no answer.	Not invited
23	Manufacturing	Cranes, lifts etc	Director Product Portfolio & Sourcing	Called, no answer.	Not invited

Appendix B - Interview guide

Interview guide
Multiple-case study

General information
This interview is a part of our master thesis project at Lund University, Faculty of Engineering to finish the master specialisation 'Supply Chain Management'. The area studied has multiple names: eSourcing, digital sourcing, source-to-contract, S2C etc.
The term 'eSourcing' will be used in this document.

The study is performed at the Trelleborg Group and this interview is part of a larger multiple-case study with different industrial companies that are currently using eSourcing.

The interview results and insights will be anonymised and put into a benchmark of how and when companies are using eSourcing. The benchmark will be shared with all participants. The master thesis report will be publicly available after its release.

Research questions
RQ1: Which are the aspects and situational factors which influence the choice among available sourcing approaches within and outside an eSourcing platform?

RQ2: What are the configuration elements which affect the success of electronic reverse auctions?

Definitions
eSourcing: A platform on which sourcing of goods or services is conducted. We focus on supplier selection rather than specification management or contract management.
Sourcing approach: After defining the goods or services to be sourced, the sourcing approach is the way of conducting the supplier selection. Examples would include:

- F2F or email-based negotiations with specific suppliers, RFx conducted per email, eSourcing platform based events such as eRFx and/or eRA.

eRFx: Requests for information/proposal/quote, that are digital within an eSourcing platform.
eRA: Electronic reverse auction, that is held within an eSourcing platform.
F2F: Face-to-face meetings with a supplier.

Introduction to your sourcing organisation and practices

The purchasing organisation in general:

1. Shortly explain how your purchasing organisation is structured. Please include:
    a. Level of centralisation
    b. Number of purchasers at the different levels
    c. Which roles in the purchasing organisation (e.g operational buyers, lead buyers, category managers etc) do you use on...
        i. ...operational level?
        ii. ...tactical level?
        iii. ...strategic level?
2. Are there differences in roles handling indirect and direct sourcing?
3. What level of purchasing cooperation and coordination exists currently?
    a. How are purchasing efforts coordinated between different roles and business areas?
    b. Which are the forums and roles that govern such cooperation and coordination practices?
4. How standardised are your sourcing processes throughout the organisation?
5. Do you have a defined process for determining specifications?
    a. Is it the same for indirect and direct purchasing?
6. Who typically has ownership of the purchasing specification in your business?
    a. Are there any cross-functional sign-off processes before you go to market?

Your category management practices:

7. Can you briefly explain what your category management practices look like?
8. How do you categorise your purchasing spend?
    a. Do you have different ways to categorise goods and services?
    b. What are the analysed dimensions for each categorisation method?
9. Has your data infrastructure limited you in your category management practices?
10. Do you conduct different forms of analysis on the purchasing spend? (other than per category)
    a. Which forms of analysis are these?
    b. Which organisational roles perform such analysis?
11. Have you defined any bundling/lotting strategies to increase contract value?
    a. Can you give any typical examples of how it is done?

Your implementation and use of eSourcing:

12. How long ago was eSourcing first implemented in your organisation?
13. Why did you implement eSourcing?
14. How far have you come in your eSourcing implementation?
    a. Are all BAs using eSourcing?
    b. Roughly how many eRFx-events do you conduct per year?
    c. Roughly how many eRA-events do you conduct per year?
    d. How many sourcing events do you conduct in total (both traditional and through the eSourcing platform)?
15. Which organisational roles are specifically connected to the eSourcing programme?
    a. ...on business area level?
    b. ...on business unit level?
    c. Are you using internal expert roles to help with parts of eSourcing? Which?
16. Has the eSourcing organisation changed over time?
    a. If yes, in what way?
    b. What was the reason for these changes?
17. How did your organisation prepare before implementing eSourcing practices?
    a. Has there been changes to the roles in your sourcing and category teams?
    b. Has there been changes to the available data infrastructure?
    c. What would you have done differently if you had the chance?
18. Have you identified any barriers or thresholds of implementing eSourcing that you did not think of when preparing the implementation?
19. What do you consider most important in order to maintain an active and organisationally compliant eSourcing programme throughout the organisation?
20. Has eSourcing changed your negotiation processes and practices?
    a. If yes, how?
21. Has eSourcing helped your organisation to more efficiently evaluate suppliers from a TCO perspective?
    a. Can you give an example of how?
22. How do you handle local capability differences with regards to eSourcing?
    a. Are you using internal experts in eSourcing? For what?
    b. Are you using external consultants in eSourcing? For what?
    c. What capabilities are you looking for when recruiting sourcing personnel?
23. Has eSourcing changed how you initiate supplier approval processes?
    a. Are they occuring more/less frequently now?
    b. Are cost attributes of TCO evaluation more accessible?
24. Is eSourcing contributing to...
    a. ...synergies in category management between categories?
    b. ...increased use of bundling to increase contract value / buyer leverage?
    c. ...other changes in the organisation?

The choice of sourcing approach

Your available sourcing approaches in general:

25. Which are the available approaches by which you source goods and services? (e.g F2F negotiations, email-based RFx, eRFx, eRA, other)
    a. Do these differ throughout the organisation?
26. Does your organisation have a defined framework for how to choose a sourcing approach? (e.g same approach in a given category, or same in each of the quadrants in Kraljic's matrix)

27. How standardised are the guidelines for how to choose between available sourcing approaches throughout the organisation?
28. What aspects do you consider important to analyse prior to choosing a suitable sourcing approach?
    a. Which role performs this analysis in your organisation?
    b. Which role decides what sourcing approach is appropriate for a given sourcing situation?
29. What aspects would favor…
    a. ...direct negotiations (F2F or email-based) with one supplier ?
    b. ...email-based RFx ?
    c. ...eRFx?
    d. ...eRA?
    e. ...other approaches?
30. What have been the main drivers of introducing eSourcing approaches (eRFx and eRA) to your "sourcing toolbox"?
31. What sourcing approach do you choose when the relative power balance (e.g company size, cost transparence etc) between you and the suppliers is…
    a. ...to your favor?
    b. ...to your disadvantage?
    c. ...balanced?
32. How is the choice of sourcing approach affected by…
    a. ...specification complexity?
    b. ...level of category spend?
    c. ...supply market characteristics?
    d. ...supplier relationships?
    e. ...supplier lock-ins due to e.g customer specifications?
    f. ...other aspects?
33. Are there situations when an RFx event can't or shouldn't be held in the eSourcing platform?
    a. If yes, why?
    b. What are the available alternatives?
34. Do you consider some sourcing approaches particularly demanding in regards to what knowledge and skill-set is required?
35. Do you consider certain sourcing approaches particularly demanding in regards to how it needs to be prepared?
    a. If yes, what aspects make the preparation demanding?
36. Do you consider certain sourcing approaches particularly demanding in regards to what data and corresponding analysis is required?
37. How does the available cycle time of sourcing affect the choice of sourcing approach? (e.g differences between long term, short term or recurring contracts)
38. Is using the eSourcing platform mandatory in certain situations?
    a. If yes, when?
    b. Can you explain the reasoning behind this?
39. Is using eRA inside the eSourcing platform mandatory in certain situations?
    a. If yes, when?
    b. Can you explain the reasoning behind this?
40. Is using eSourcing or eRA advised against (or prohibited) in certain situations?
    a. If yes, when?
    b. Can you explain the reasoning behind this?
41. What general aspects make it preferable to add eRA as opposed to only use eRFx?
42. What is the primary value proposition/most valuable benefit of using eRA?
    a. Financial benefits?
    b. Non-financial benefits?
43. What is the primary value proposition/most valuable benefit of using eRFx?
    a. Financial benefits?
    b. Non-financial benefits?
44. How do your purchasing organisation understand and evaluate the "Total Cost of Ownership"/"Landed Cost" of choosing or changing to a new supplier?
    a. Which cross-functional actions are undertaken?

Your available sourcing approaches from a category perspective:

45. What does your direct purchasing organisation look like?
46. What does your indirect purchasing organisation look like?
47. Are there any differences in how you analyse direct and indirect categories?
48. How are indirect categories managed from a sourcing perspective?

a. What aspects govern the choice of sourcing approach for indirect sourcing?
b. To what extent are you using eRFx for indirect categories?
c. To what extent are you using eRA for indirect categories?

49. How are direct categories managed from a sourcing perspective?
    a. What aspects govern the choice of sourcing approach for direct sourcing?
    b. To what extent are you using eRFx for direct categories?
    c. To what extent are you using eRA for direct categories?
50. How are the purchasing categories evaluated and analysed before making the choice of appropriate sourcing approach?
    a. Which are the important aspects in such category analysis?
51. Which categories are best fit for…
    a. ...direct negotiations (F2F or email-based)? Can you explain why?
    b. ...email based RFx? Can you explain why?
    c. ...eRFx? Can you explain why?
    d. ...eRA? Can you explain why?
    e. ...other approaches? Can you explain why?
52. Which category aspects make eSourcing (eRFx, eRA, other ways) the appropriate sourcing approach? Can you explain why?
53. Which category aspects makes traditional sourcing (direct negotiations, email-based RFx) the appropriate sourcing approach? Why?
54. What category aspects make an eRA sourcing approach preferable over only eRFx?
    a. Why are these aspects important?
55. If you once again were to roll out eRFx in your category sourcing strategy…
    a. ...would you start with certain categories? Which and why?
    b. ...would you wait with certain categories? Which and why?
    c. ...would you exclude certain categories? Which and why?
56. If you once again were to roll out eRA in your category sourcing strategy...
    a. ...would you start with certain categories? Which and why?
    b. ...would you wait with certain categories? Which and why?
    c. ...would you exclude certain categories? Which and why?

Electronic reverse auctions

eRA configuration in general:

57. Which are the elements that you consider when configuring an eRA event?
    a. How do you typically analyse these elements?

Planning and design parameters

58. Which steps does preparing an eRA sourcing process consist of?
59. What information and data is needed prior to conducting an eRA?
60. Are eRAs mainly seen as a price discovery or contract allocation mechanism?
61. How are eRA participants identified and selected?
    a. Are there specific requirements for invited suppliers?
62. Must suppliers be approved for business before being invited to auction events?
63. How many suppliers are typically invited to an eRA event?
    a. Is there a minimum?
    b. Is there a maximum?
    c. Is there an optimal number of participants?
64. How are internal stakeholders preparing for the eRA sourcing event?
65. How are external stakeholders prepared for the eRA sourcing process?
    a. ...training sessions?
    b. ...test events?
    c. ...what other information is given?
66. With what level of buyer commitment do you engage in your eRA events?
    a. e.g. no commitment, ranged/full contract value?
    b. How is this communicated to suppliers prior to the event?
    c. Are there situations when you waiver the communicated commitment?
67. Are you using...
    a. ...different auction types (japanese, dutch, english etc…)? Which?
    b. ...different ways to display supplier bids or rank? Which?
    c. ...different bundling/lotting strategies? Which?

68. Is the eRA designed specifically for a new sourcing situation or previous designs reused?
69. Are there different desired outcome(s) of using eRAs?
    a. If yes, do you design eRAs differently to achieve each outcome?
70. Could you describe a typical eRA process...
    a. ...from preparations to post-auction actions?
    b. If there are multiple designs, what are the main differences?
71. What actions are you conducting pre-auction? (are RFx always preceding, are all participating supplier TCO evaluated before, etc.)
72. What actions are you conducting post-auction? (are there further negotiations, supplier approval, etc.)

Auction process governance

73. Are eRAs used in some way to evaluate potential, but non-approved, suppliers from a cost perspective?
74. Do you use a bonus/malus system in the auctions? (e.g. current supplier gets an auction bonus matching the cost of switching to new supplier)
75. How do you communicate with suppliers…
    a. ...before the auction event?
    b. ...during the auction event?
    c. ...after the auction event?
76. How do you ensure the auction to be held in an ethical manner?
    a. Have you experienced unethical behaviour from participants in auctions?
77. How do you stimulate suppliers to consistently participate in auctions?
78. Do you communicate with suppliers that do not win the contract? How?

Creating auction bid engagement

79. How do you stimulate bid engagement among participating suppliers?
80. What contract values should be subject to an eRA event?
    a. Is there an average contract value for your organisation?
    b. Is there a minimum contract value?
    c. Have you identified an optimal contract value?

Buyer-supplier relationship management

81. Are eRAs only used in specific types of supplier relationships?
    a. Which types and why?
82. Are eRAs advised against for certain types of supplier relationships?
    a. Which types and why?

Appendix C - Single case reports

C.1 Case Gamma

Gamma manufactures on-road load handling solutions and is present on the global market with a turnover of €1,36B annually. The product range includes loader cranes, truck mounted forklifts, skiploaders, hooklifts, tail lifts, etc. The customers are companies, both private and public, ranging from single truck owners to international fleet operators.

C.1.1 Sourcing organisation and processes

Gamma's procurement function is divided into direct and indirect divisions. The direct procurement is branched over the different product categories while the indirect organisation is structured over geographical regions. The hierarchy is similar in both direct and indirect with the exception that the direct procurement organisation is larger. The primary roles are as follows:

- *Category/Sourcing Director:* The Category Directors and Sourcing Directors are the top managers that report to the VP Sourcing. They have similar roles but their area of responsibility is centered around either a product category or a business unit, e.g. a factory. The directors are leading the work and strategies for sourcing in their respective area.
- *Senior Manager, Sourcing*: A role within sourcing which helps the Directors to lead the sourcing teams. They lead one or more local teams in different geographical regions.
- *Category Manager*: When dividing the product categories into subcategories the Category Managers are the people responsible for the strategic plans and workflow within each subcategory. If the team is centered around a business unit the Category Managers are responsible for the strategic work with the categories in that BU. Often the Category Managers drive sourcing projects and makes sure that all products within a category has up to date contracts
- *Sourcing Specialist*: An operational role that is responsible for the sourcing and negotiations of contracts. Following the current strategic plans and assisting the Category Managers in the creation of future strategic plans.

The organisation does not have a large centralised sourcing organisation, instead the individuals are decentralised and placed closer to the operations. The hierarchy is however very clear and common central decisions are taken, for example the eSourcing platform was decided to be used among all purchasers and that all sourcing should be processed via the platform. This also means that no internal expert team exists and the competence is accumulated locally within each business area and then, using general training and education, the knowledge is transferred.

On the direct procurement side, three standard sourcing processes are in place which are the same for all categories and adopted in all business areas, and these are called:

- Spot buy,
- Simple sourcing project, and
- Strategic sourcing

The process depends on the level of spend and the difference between them is the level of detail in the process, a higher spend will increase the importance and therefore demand a more detailed process. Another process, also standardised, exists for sourcing "new product design". Which is a process made in close collaboration with R&D to source material for the new products. The indirect procurement also has three standard sourcing processes of similar character to the direct procurement, divided into detail depending on the level of spend.

C.1.2 Maturity in eSourcing utilisation

Gamma went live in 2016 with their eSourcing platform from Ivalua and they use the five modules: The supplier management module, the sourcing module, the contract module, the reporting module and the budget/savings action reporting modules. The platform is connected to the ERP-system and the data transfer intertwined. They still consider themselves young in the use of eSourcing and this spring new training of the platform were held in order to refresh the users knowledge to get more efficient use out of the system. All sourcing processes, except claims and supplier approval processes, have been connected to the platform and therefore top management has made it mandatory for purchasing individuals to source using the platform. All RFx for indirect materials and services that were previously done through email or similar are therefore now done as eRFx. For direct materials, the majority of price renegotiations and/or RFx are done manually outside of any eSourcing platform. Suppliers are still invited to direct negotiations after eRFx rounds if not a bid is accepted directly, but the initial steps are strictly done in the system. The reporting and measurement of KPIs are one of the important benefits of the system.

The plan was to have performed the first eRAs by now but these plans were delayed because of the Covid-19 pandemic. The project to implement these have been put on hold and is expected to continue when business is back to normal.

C.1.3 Important aspects of choosing sourcing approach

Gamma has made the decision to do all sourcing through the eSourcing platform regardless of category. This means that all supplier data and all contracts must be registered in the system. Therefore no direct aspects to differentiating sourcing approaches could be made between using or not using a platform. It should be noted that even the shortest sourcing processes, which would be a spot buy or price update only including one supplier, are also conducted using the platform. Initiating a sourcing process with only one supplier is normally only due to a time element when there is a hurry to purchase the product. Otherwise an eRFx round is sent out and following negotiations are held.

Either if choosing to go directly with one supplier or sending out one or multiple eRFx rounds it always ends in negotiations. The eRA has yet to be implemented and depending on the complexity the negotiations could either be F2F or sent by email. Conducting the negotiations F2F is a lot quicker than waiting for emails to be sent back and forth and could be favored in a time limited sourcing process.

The reasoning behind enforcing the use of the eSourcing platform was identified to the control the system gives. KPI’s are easier to set and to measure, contract management is more efficient and the master data works together with the central ERP. It is both easier for individuals to control their work as it is easier for the management to steer the whole sourcing operations.

C.1.4 Within-case analysis

The within-case of Gamma, as no eRA program was present at Gamma the within-case analysis only analyses the aspects of choosing sourcing approach.

Aspects of choosing sourcing approach

The eSourcing platform was made standard and mandatory practice for sourcing activities at Gamma three years ago. By then it had been live about a year with successful proof-of-concept testing and fine tuning it to the organisation. Table C.1 summarises the expressed benefits of eSourcing which are highlighted in the Gamma case. The previous data structure was considered insufficient and the KPIs used to monitor organisational performance was therefore followed up on with irregularity. The need for improved data infrastructure was a major reason for implementing eSourcing. Since not being able to measure the processes appropriately before, the perceived process improvements were hard to analyse as the data sets are not

comparable. It was believed that eSourcing improved the sourcing process efficiency, but it is hard to prove.

When all sourcing is decided to be conducted inside an eSourcing platform it is important to notice the versatility of the tool. All different product categories have been able to be moved into the system, meaning that big strategic categories and small non-critical items all fit into it. All the different sourcing situations also work with the platform, meaning the short process of a spot buy to the much longer strategic sourcing process. Even if eSourcing might be very different from traditional sourcing in how it handles data and transitioning into digital interfaces, it is able to fulfill all the needs that traditional sourcing has previously had.

Table C.1. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Gamma
Better data management	x
Increased supplier invitations	
Direct cost reductions	
Improved cross-functional workflow	x
Process time savings	x
Exploiting frontier technologies	

Even though not entirely centrally organised with a large purchasing function, the top management is still able to take company-wide decisions. This enabled Gamma to shift into the position of everyone using eSourcing. In Table C.2, their purchasing organisational structure is defined as a center-led hybrid mainly due to its central decision-making characteristics. In the same table, it is highlighted that Gamma have deployed a central category management team, which in turn is further supposed by category sourcing directors which are ultimately responsible for the category sourcing.

The better data structure did not only enable the use of common KPI's in the whole organisation with better analysing tools but also an increased cross-functional flow. With the data easily accessible in the eSourcing platform other departments, mainly the cooperation with R&D were discussed, that could help the success of a sourcing event. A separate workflow had been created in order to improve the cooperation between sourcing and R&D which previously had been performed in an unstructured manner. It does not automatically mean that the output is better now, but the informant indicated that it was. It was however pinpointed that the data infrastructure can still be a bottleneck, and its improvement is therefore high up on the agenda.

Table C.2. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Gamma
Organisational structure in purchasing	Centre-led hybrid
Central sourcing analyst team	
Central category management team	x
Internal eSourcing consultant team	
Data infrastructure	Sometimes bottleneck

Table C.3 pinpoints the competitive barriers which Gamma highlighted. Given the nature of Gamma's industry segments, downstream bills of materials is a common barrier to leveraging supply market competition. Supplier certification complexity as well as a lack of supply market analysis throughout their sourcing process was further mentioned as barriers which sometimes makes it difficult to efficiently apply supply market leverage. The eSourcing platform was highlighted to remedy parts of these difficulties, through the improved cross-functional workflows mentioned in Table C.1.

High switching costs were also a heavily emphasised barrier of conducting competitive supply market exercises. However it was simultaneously stated that the characteristics of this barrier had by no means been changed due to new digital approaches, and that supplier TCO evaluations were conducted the same as they always had priorly.

Table C.3. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Gamma
Downstream bill of materials	x
Supplier certification requirements	x
Lack of supply market analysis	x
Difficult supplier approval processes	
Geographically bound supplier base	
High switching costs	x
Proprietary technology, patent positions	

How Gamma has addressed achieving organisational compliance in the eSourcing utilisation is shown in Table C.4. An organisational barrier of using eSourcing was found in that not all purchasers were proficient in using the new system. An initial training had helped purchasers to understand the features and try it out when the system was first implemented. But with time top management understood that all users did not fully grasp the system and decided upon additional training. It is important to understand that choosing to use eSourcing demands different skills and purchasers that have been using other methods need to learn something new. Especially if it is decided that everybody must use the eSourcing platform in their sourcing.

Table C.4. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Gamma
Dedicated eSourcing team	
Centrally facilitated training	x
eSourcing performance management	
Master-data management	
Internal consultants or super users	

The motives were very interesting to understand as the main use of eSourcing was the supplier management and contract management. This implies that the data structure is one of Gamma's most important aspects of using an eSourcing platform and necessarily not the process efficiency improvements. The supplier management and contract management modules used are examples of eSourcing modules which focus on digital sourcing process integration, as highlighted in Table C.5. A contract management module creates cross-functional interfaces between legal and purchasing, whereas a supplier management module creates cross-functional interfaces between purchasing and operations in which e.g. supplier performance can be evaluated over time. From a system perspective, Gamma have integrated their systems in an extensive manner which further add to these effects.

Table C.5. Utilised eSourcing disciplines.

eSourcing focus	Gamma
Primarily sourcing process integration	x
Primarily increased supplier competition	

C.2 Case Epsilon

Epsilon is a global conglomerate with main businesses in agriculture, energy and food industries. The focus is on creating value for farming, from the beginning of helping farmers cultivating crops into refining the yield and producing foods and bio-fuel. The customers are both in B2B and B2C depending on the company within the conglomerate.

The company is global but geographically centered around the Nordic countries with about two thirds of the turnover. The whole organisation has a turnover of €4,4B.

C.2.1 Sourcing organisation and processes

The sourcing organisation of Epsilon is decentralised, there exists a small central organisation but every daughter company or division has their own purchasing department where all sourcing takes place. The central organisation is focused on creating company-wide sourcing strategies, managing sourcing IT-systems and arranging training and education for the sourcing professionals throughout the organisation. Such training and education is typically related to sourcing analysis and the use of the eSourcing platform.

One example of their purchasing organisational structures is that of one division, which is shown in Figure C.1. The division has one Head of Procurement with six different product categories and a Category Manager, Lead Buyer or Strategic Buyer for each of these categories. The Head of Procurement reports to the division's management, rather than central top management. The organisational setup of the other divisions within Epsilon are similar.

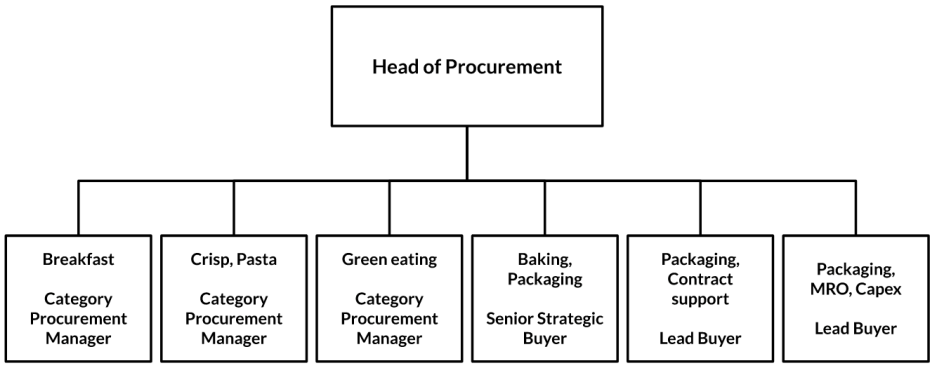

Figure C.1. Purchasing organisation of a daughter company in Epsilon.

A 'Procurement Committee' exists with representatives from the different divisions to enable common practices and dialogue. The Procurement Committee for example has defined a single set of product categories that is common for all business areas within the organisation. This Procurement Committee anchors important decisions taken with the whole organisation.

The Epsilon sourcing process is a five-step linear process shown in Figure C.2.

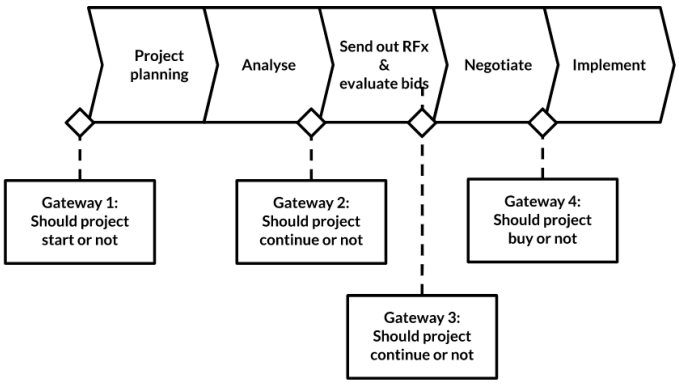

Figure C.2. Epsilon five-step linear sourcing process.

The first step of project planning starts with defining the project with its scope and expected results. A project organisation is decided upon and to utilise adequate resources. When a scope and a project organisation is on board the project planning step is finalised with a time plan.

The next step is to analyse the demand, both internally by understanding the need and externally by understanding the market. When analysing the internal needs the product specifications are challenged and set, different risk aspects are assessed, spend analysis and TCO calculations are considered together with other analysing models. When analysing the external market the risk aspects, market complexity and other analysing models are used and a long list of potential suppliers is created. Two models mentioned being used explicitly are the Kraljic Matrix and the Porter's Five Forces. After analysing the product, a sourcing strategy is put into place and the first gateway is posed. If the expected price and risk is too large in regards to the internal need, the sourcing process would end here. However, if the need is big enough and a commercial viability still exists the process will continue.

If deciding to continue with the sourcing process RFx are created together with evaluation criteria. The RFx are sent out to the long list of suppliers and their respective bids are then evaluated through the proposed criteria. The best suppliers are then chosen to bring forward into the next step of negotiations.

In the negotiation focus lies on TCO and a KPI scorecard is used to evaluate that. Different negotiation tools exist, one of which is the eRA. In the negotiation, an implementation plan would also be proposed and a sourcing report created for the preferred suppliers. The second and final gateway of the process is then asking if any supplier is good enough. If the commercial viability still exists, the process will continue by choosing that supplier.

The final step is to implement the chosen supplier by signing the contract and follow up on the proposed implementation plan. All other suppliers participating in negotiations are sent letters that their offers are kindly turned down

C.2.2 Maturity in eSourcing utilisation

Epsilon implemented their eSourcing platform in 2015 but did not force the organisation to use it. They have purchased licenses from Scanmarket to use eRFx and eRA in one platform, no other modules are used in the platform and this is separate from any ERP and can therefore be used by any individual within the organisation. They do have a contract management module in an ERP but not in the eSourcing platform where the eRFx and eRA are held.

The information gathered from an eRFx does not differ from the RFx and the platform is therefore used as any other tool within the sourcing process. The individuals adopting it have been the people interested either in this new tool or those that has seen the potential of it.

Meanwhile the resistance often comes from the people wanting to keep old habits. Epsilon currently sends a few hundred eRFx per year, but did not know how many that were in regards to the total amount as there is no statistic of how many RFx's sent by email. Nevertheless, the use of eSourcing is believed to still be used on a very small scale. The main benefits are seen as process improvements as it is more efficient to source through the platform than through old methods such as using email.

The use of eRA in the negotiation process is gradually increasing. It is still early in their implementation and several different methods have been used. The eRA is very different from the common negotiation practices and is harder to implement widely in the organisation than the eRFx.

C.2.3 Important aspects of choosing sourcing approach

One of the most important things to note at Epsilon is their globally decentralised purchasing structure. The choice of sourcing approach is decided by the respective purchaser or business unit. Thus all purchasers within the organisation were not fully aware of how to use the eSourcing system, since it was still relatively new. When describing the choice of sourcing approach the discussion was binary as in either using traditional sourcing methods or an eSourcing platform.

The biggest challenge observed was to get people trying it out, to get purchasers create an eRFx in the platform instead of the normal routine. The early adopters in the company, that have embraced working in the platform, describe it as more efficient. One clear benefit of using it was the clear overview of a sourcing event. As an example, they recently had held a sourcing event sending out eRFx's for multiple products with over 70 invited suppliers. The process benefits were tremendous, as the event owner could follow the progress of all suppliers from one monitoring 'control tower' view. When needing an update from the suppliers individual emails were not needed as they could check directly in the system, and only send reminders to suppliers that needed them. In a traditional setting, either a reminder was sent to all suppliers or they had to wait until a supplier missed the deadline before contacting them. Because of the process benefits, slack time could be removed and significant time savings were also seen. The time saved was used to conduct more eRFx events and therefore be able to put market advantage on more categories than before, with the expectation to lower costs with every eRFx event conducted.

Another aspect of choosing eSourcing is the consolidation of data. As every eRFx event is saved in the same database and available to search from, different kinds of analytics could be used upon this data. As the company is global and decentralised a big potential is that an eRFx sent by a company in one business area could be accessed by another company in another business area. Which would not be possible in traditional sourcing processes where each purchaser would locally store any answered RFx or maybe only share with the stakeholders important for that particular sourcing process. The collected data is not only useful for others, but it is also useful for the individual purchasers as all of their RFx's are collected in a systematic way which helps structure the process more easily. All of the previous eRFx's are logged and can be fetched and used, either for reading and understanding the prices or as a template for a new and updated eRFx.

When Epsilon implemented eSourcing a clear cross-functional benefit was seen as the stakeholders in the sourcing process could be invited to sourcing events. In these events, they could either follow them and update themselves on the progress, not relying on the purchaser to provide them with every bit of detail in the process making for a much smoother cooperation. But the different stakeholders could also be used as experts in the sourcing events and when questions from one supplier needed an answer they could answer it and post it for all suppliers to see. This level of cooperation is all too cumbersome to perform in traditional sourcing at Epsilon and is now seen as a major aspect favoring the use of eSourcing.

C.2.4 Elements considered when configuring eRA processes

As described, the eRA was seen as a tool for negotiation in the sourcing process at Epsilon and that an eRFx would always precede the auction. The reason for this was that the comparability between bids in an eRA is imperative and without it there could be no proper auction. By conducting an eRFx event prior to the eRA the comparability between suppliers could be evaluated and if not comparable, the purchaser would not pursue an eRA but rather negotiate in a traditional fashion. For comparability to exist all suppliers have to compete on common rules and only allowing qualified suppliers to participate will ensure that. Comparability between bids was not the only configuration element important for using eRA but it was considered the most important.

When inviting suppliers to an eRA event the minimum number of suppliers were considered as three, if any lower the competition would not be proper and the ethics questionable. On the other side of the scale no maximum seemed to exist, only the practicality of inviting comparable and competitive suppliers was the limiting factor. It is important to note that if there are several comparable suppliers but one is more competitive and better in all perspectives the eRA is not suitable as there has to be competition in order for the eRA to be successful.

The auction design was discussed and the type or technical settings of the auction did not drive the success. One design parameter was the bid disclosure and these were always set using a “traffic light” colour code with a ‘green’ bid being the leading bid, ‘yellow’ bid being a bid close to the leading bid and ‘red’ as far off the leading bid. This made sure suppliers knew how competitive they were without getting market data from the other suppliers. Epsilon determined the winner after the auction and not when it closed. This was explained as a moral principle to not drive the suppliers to put unreasonable low bids and for getting the lowest TCO if multiple lots were up for auction choosing the best fitting combination. By using this type of winner determination the market price can be found, as the suppliers do not have an incentive to go below a profitable price.

The preparations for the eRA event largely consisted of the eRFx event. Because of this process of first having an eRFx no additional supply market analysis was needed and the specifications were good enough for supplier bids being comparable. Training and mock auctions were provided for the suppliers needing it prior to the auctions and all purchasers at the company have both got educated in the eSourcing platform and there exists experts ready to help them if needed.

The supplier relationship was very important and clarity in communication of intentions and keeping sound ethical and moral principles would help ensure that. Using the eRA as a negotiation tool did not hinder from communicating with the supplier outside of the eSourcing platform keeping good relationships. Giving feedback and thanking all suppliers for participating is important to keep suppliers interested enough to participate in the next eRA.

C.2.5 Within-case analysis

Epsilon was similar to Trelleborg Group in many ways, the decentralised structure and the diverse set of businesses. The case was very interesting as Epsilon had implemented both eSourcing and conducted plenty of eRAs, and a lot was learned during the interviews with the informants at Epsilon.

Aspects of choosing sourcing approach

Epsilon had implemented eSourcing to let their purchasers have access to digital sourcing processes and eRAs. They understood that several benefits existed but mainly only the savings and speed in the form of time savings was mentioned when compared to the benefits identified by Schnellbächer et al. (2018). Especially the enormous increase of ability to invite suppliers was utilised, as one event invited over 70 suppliers.

Table C.6. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Epsilon
Better data management	
Increased supplier invitations	x
Direct cost reductions	x
Improved cross-functional workflow	
Process time savings	x
Exploiting frontier technologies	

The overall organisation at Epsilon is decentralised and the purchasing organisation is no different. Table C.7 shows the analytical foundation of Epsilon. For helping purchasers to use eSourcing a consultant team of experts exist that are available to consult if needed and to evaluate if sourcing approaches using the eSourcing platform could be utilised. The data infrastructure to conduct analysis was deemed sufficient by the informants at Epsilon.

Table C.7. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Epsilon
Organisational structure in purchasing	Decentralised
Central sourcing analyst team	
Central category management team	
Internal eSourcing consultant team	x
Data infrastructure	Sufficient

Epsilon did experience several barriers for conducting competitive supply market exercises, as seen in Table C.8. Certification requirements are very important in the food industry as every country has regulations on food handling and often use certifications to approve if companies can sell food on the market. This barrier is out of Epsilon's reach, and therefore supply market analysis has to be performed to see if new suppliers or other suppliers have been certified. Several suppliers were very integrated with the operation processes and switching them would be proved very costly. Which poses a large barrier for Epsilon. These barriers were consistent with the identified barriers by Gelderman & van Weele (2003).

Table C.8. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Epsilon
Downstream bill of materials	
Supplier certification requirements	x
Lack of supply market analysis	x
Difficult supplier approval processes	
Geographically bound supplier base	
High switching costs	x
Proprietary technology, patent positions	

Out of the six different barriers the Schoenherr (2019, p. 21) presented Epsilon only experienced the internal resistance, with the methods of mitigation it shown in Table C.9. As Epsilon did not change any sourcing process or forced any purchaser to adopt the tool it is regarded as hard to let purchasers themselves build the sense of urgency to actually use the tool. With training of purchasers they could tell of success stories and complement the training the appointment of super users that can both help purchasers in a sourcing event but also push individuals to try the system out.

Table C.9. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Epsilon
Dedicated eSourcing team	
Centrally facilitated training	x
eSourcing performance management	
Master-data management	
Internal consultants or super users	x

Epsilon had implemented eSourcing as an extra tool for the purchasers to use. In Table C.10 it can be seen that they primarily utilise a discipline of increased supplier competition. They have been using eSourcing as a method to put market leverage on new product categories within purchasing.

Table C.10. Utilised eSourcing disciplines.

eSourcing focus	Epsilon
Primarily sourcing process integration	
Primarily increased supplier competition	x

The decentralised structure of Epsilon does play a huge role in how the sourcing and the different sourcing approaches are used. The central organisation has structured a company-wide sourcing process map and put recommendations on how to follow it but there is not one uniform approach but instead interpretations and process adaptations fitting for the context of all subsidiaries. Without a clear mandate to force the use of new tools or sourcing processes it has made eSourcing to spread only where the purchasers have been willing to use it and there exist plenty of instances where practitioners have continued to use traditional sourcing methods. As this study has been on choice of sourcing approach and configuring eRA the interview and discussion with informants was focused on the parts of the organisation that used eSourcing, even though it should be remembered that many purchasers have chosen to still use traditional sourcing approaches.

Because of this decentralisation eSourcing was viewed as an additional tool that might be used in sourcing, and therefore it is easy to understand that all adopters are positive of the tool as if they were not they could simply ignore it. The sourcing process is still the same for both practitioners of eSourcing as those not using it, the centrally defined sourcing process and the KPI are still the same. It would be interesting to view the performance of sourcing divisions over time to be able to see if there will be a change. The adopters of eSourcing expressed the “process benefits” as one key aspect to use the tool in sourcing which is a bit unambiguous. The rendering of this is that the major benefits are not viewed as directly financial benefits, even though a better process will implicitly save costs. Delving into these process benefits several aspects of choosing sourcing approaches crystalised.

One was the communication and amount of control it gave the users. In a traditional sourcing process the purchasers could only handle a few suppliers at any given sourcing opportunity, but eSourcing enables the purchaser to invite more suppliers to an event. When communicating with suppliers there was no dialogue between the purchaser and every individual supplier but instead an interface between them exists and the purchaser could post information directly in the eSourcing platform event. As the communication was done in the platform the risk of forgetting something is also reduced, hence the perceived increase of control. All of the supplier's progress were monitored and then the laggards could be targeted with reminders when approaching a deadline.

The second aspect linked to process benefits was the time aspect. If there were little time before the product had to be sourced it would be faster to conduct an event in the eSourcing platform than outside of it. This was mainly due to two reasons, the first being that old events

could be copied and the second that slack or waiting time is reduced. By using old data from old events the process of setting up a new sourcing event is greatly reduced as previous offers from suppliers are stored and could be used as the starting point of this new sourcing event. The old event does not have to be one individual purchaser's event, but sharing between purchasers and looking for similar events from other business areas could help reduce time. Previously purchasers could only search their own email inbox, but now they can use a whole organisation's database of old eRFx's. This of course implies that the data is managed properly and that metadata from events are searchable. The reduction of slack time derives from the previous mentioned aspect of communication and control. When communicating with suppliers the purchaser will see each supplier's progress and this will help them to efficiently send reminders. These targeted reminders can be sent before deadlines as a purchaser sees who has read the information and who has not, making the wait for laggards much shorter.

The third aspect of choosing eSourcing because of the process benefits was the enabling of cross-functionality. The ability for other departments than the purchasing department to engage in the sourcing process has previously been limited. They have been invited to create the demand specifications, give input to TCO calculations and might act as counsel during the sourcing process. But with eSourcing all stakeholders can be invited to the sourcing event and if any questions arise, e.g. regarding the specifications, they can directly answer either the individual supplier who posed the question or all suppliers invited to clarify for everyone. An analysis is that it does not only simplify the process as the correct stakeholders can answer questions in their specific area, but it can also be a builder of trust within the organisation as they too can be included and monitor the process.

A last aspect found of choosing eSourcing was not directly related to the process benefits. It was instead the value of the data that were being generated. This might not be of importance for one single sourcing opportunity, but the data produced can be used for analysis and helping the purchasers understand strengths and weaknesses. The gathered data is not only of use for the individual purchasers but also for the purchasing department as a whole which can track macro level trends and optimise the use of eSourcing by creating better KPI's when better data is available. This aspect is of course rendered void if the organisation does not use the data and it can be hard to use it if not managing and cleaning it properly.

Configuration elements critical to eRA success

The successful eRA program at Epsilon was interesting as the informant was careful to point out the difference between regular negotiations and negotiating through auctions. This large difference in the sourcing process made the adoption rate of eRA a lot slower than eRFx, as eRFx was much more similar to its counterpart RFx. When conducting this revolutionary new tool it had not always gone as planned but the overall performance was very satisfying and different settings were still tried out.

The eRA program at Epsilon was extensive and expanding fast within the company. A governing structure was set and is shown in Table C.11.

When implementing eRAs the biggest difference was the level of comparability between bids needed to perform an auction as it is more static. If it was clear in the eRFx that a lot of soft values would affect the supplier bids then an eRA would not be suited, for example how do you set a price on soft values as a company brand value? Because even if the technical specifications are equal the expected communication might be smoother or the after purchase service better with one supplier. Therefore it is important to understand the product and the sensitivity to values different from price it has making it more comparable in an auction setting. This is also a reason for never having full buyer commitment in an eRA. When not having full buyer commitment there exists enough leeway to incorporate soft values that are not able to be seen during the event. The limit to how much a purchaser could change the outcome was not explicitly stated but would be thought of as an ethical boundary, because if inviting a supplier and then having them win the auction just to snub them of the contract does not look good and the purchaser have to communicate with the suppliers that do not win the contract.

Limited disclosure of bids is the standard nowadays and Epsilon does make use of this. It is mainly used to protect the suppliers from other unethical behaviours of other suppliers. Which helps getting all suppliers to put their best bid into the eRA as identified by Jap (2007).

Table C.11. Configuration elements of the governing structure in eRA events.

Principle, policy or guideline	Epsilon
Level of buyer commitment	Internal policy
Supplier participation principles	Only approved
Level of bid disclosure	Limited disclosure
Policies regarding bid disclosure	Internal policy
Defined ethical guidelines	Yes

The eRA program at Epsilon did not prevent any eRAs to be conducted in important segments, but it was deemed critical to handle the relationships professionally and not damage them by distancing suppliers from the company. This is seen in Table C.12.

Because the new process of negotiation is completely different, it is important to create new ways of communication. It did not differ significantly from literature but a larger focus on ethics was displayed by the informants, this might be because the eRA program is still very new and they are still very careful not to damage their reputation in the first auctions. In the Carter et al. (2004) study the two risks of 'Reputation' and 'Explain intentions' were the two that seemed most important to Epsilon. By having clear intentions with the suppliers about the purpose of the eRA and cooperating with them they hoped to improve their reputation and get new functioning supplier relationships with this new sourcing process.

Table C.12. eRA utilisation and supplier relationship management.

SRM related eRA guidelines	Epsilon
eRA use principle based on SRM segments	No
SRM impact on eRA recurrence	Critical

As mentioned Epsilon was a decentralised company with multiple daughter companies. No centrally organised data infrastructure was available instead local IT-systems were, in Table C.13 the defined data infrastructure is therefore not applicable as it exists but in many different settings. The eSourcing platform was created as a stand-alone system at Epsilon and did not require any specific data infrastructure to function. For every business area there were local super users appointed and these could help purchasers in the existing setting.

Table C.13. eRA data infrastructure

eRA data infrastructure	Epsilon
Defined data infrastructure/strategy	N/A
Data infrastructure defined with clear focus on eRA performance management	N/A
Deployment of eRA master-data management	Local super users

When configuring eRAs the centrally purchasing team did not have the mandate to decide how local purchasers should design any eRA. But as seen in Table C.14 the recommendations were to keep everything simple, use simple formats such as the English reverse auction and keep the only award criteria to measure price. However, since Epsilon does not act with full buyer commitment the eRA mechanism will per default only be a price discovery (Elmaghraby, 2007). The pre versus post auction balance did not significantly change at Epsilon as the eRA was used as an alternative tool to direct negotiations. Because of not having full buyer commitment the balance weight did not significantly change as post auction analysis has to be conducted.

Table C.14. Configuring the eRA design.

eRA design parameters	Epsilon
Auction type	Simple formats (e.g. English)
Main award criterias	Price
eRA mechanism	Price discovery
Event length	N/A
Closing rules	N/A
Pre vs. post auction balance weight	Unchanged

In Table C.15 it can be seen that a lot of preparations are conducted at Epsilon before entering the live eRA event. The need for proper supply market and category analysis were highlighted as this will be needed to make the specifications clear. But the most important part of preparations was to achieve clear specifications that enabled comparable suppliers.

Before inviting any supplier to an eRA event all are sent an eRFx and the supplier's answer to this will be the pre-qualification of the supplier. Only approved suppliers will then be invited. Conducting these steps are very consistent with the process proposed by Arnold et al. (2005).

Epsilon offers training for both purchasers and suppliers in order for everyone to be sufficient in the eRA events. This is not to improve the success of the outcome as much as it is to limit the downside of failure.

Table C.15. Preparing the eRA event.

eRA event preparations	Epsilon
Supply market analysis	Yes
Category analysis	Yes
Importance of clear specification	Very important
Pre-qualification of participants	Yes
Purchaser training	Yes
Supplier training	Yes

Epsilon had conducted plenty of eRAs but had not actively utilised any strategies for improving supplier bid engagements. In Table C.16 Epsilon's view on these configuration elements are still portrayed. No additional action for getting or evaluating supply market competitiveness or using bundling or lotting strategies were used. It was not that Epsilon did refrain from such actions, but these were not a part of the eRA program as much as it was thought of in the normal sourcing process and hence decided upon earlier in the process.

Regarding the minimum contract value Epsilon did not see any limit, the eRA is an alternative to direct negotiations and in certain circumstances eRAs are less time consuming and easier to conduct. Suppliers that would attend a direct negotiation meeting for a small contract would then in this logic also participate in an eRA. This is very different from theory as the lowest limit for an eRA found in literature was rather sizable $150.00 by Schoenherr (2019, p.90). No maximum contract value was present, it was only regarded as more beneficial if the contract value is higher, which is consistent with literature (Beall et al., 2003).

In literature researchers seem to agree on the minimum number of suppliers as three (Beall et al., 2003;, which Epsilon also agrees on. But in contrast to literature the maximum was not so clearly defined according to Epsilon. This is firstly believed to be because of that the digital proficiency of the modern day workforce is much better today and therefore invited suppliers do not need as much help as before to understand how to operate in an eSourcing platform. With suppliers comfortable and used to the tools less work is needed to help them and therefore more can be invited without putting too much workload into the process. The second reason is that the current eSourcing tools are much stronger and sophisticated today, they are

specialised in only showing the most important aspect of the events and enabling purchasers to focus on value-adding activities such as inviting and dealing with more suppliers.

Table C.16. Configuration elements of supplier bid engagement

Improving supplier bid engagement	Epsilon
Supply market competitiveness	N/A
Contract minimum value	No min
Contract max value	No max
Bundling and lotting strategies	No
Minimum number of auction participants	3
Maximum number of auction participants	No max

In Table C.17 the eRA process integration at Epsilon is seen. The eRA was only seen as an alternative to the direct negotiations and the sourcing process was not redefined due to the introduction of eRAs. It did however expand the process step of analysing and selecting suppliers and therefore partially changed the process. With experience from conducting eRA events Epsilon had updated and improved their sourcing process, especially this was seen in that inviting additional did not pose a barrier in the eSourcing environment.

Table C.17. eRA process integration.

eRA process integration	Epsilon
eRA impact on sourcing process	Partial
Sourcing process altered by internally developed best practices	Yes
Sourcing process altered by identified external best practices	No
Extended analysis phase within sourcing projects to adhere to eRA fitness analysis	Yes

The eRA infrastructure integration on Epsilon is seen in Table C.18. The only integration that Epsilon had was the central team that tied all knowledge together and offered all the eRA training. After that all processes were conducted locally at every business area or unit.

Table C.18. eRA infrastructure integration (system and organisation)

eRA infrastructure integration	Epsilon
eRA (organisation) infrastructure integration	Yes
eSourcing team facilitating organisational eRA training	Yes
Central analyst team ensuring eRA applicability	No
Central eRA team conducting all eRAs	No
Required category manager skills impacted by eRA utilisation	No
Emphasis on central master-data management	No
eSourcing and eRA data generation integrated with other IT systems	No

Epsilon did not focus heavily on the performance management, seen in Table C.19, as the eRA program was still young. But still Epsilon measured all the realised savings to understand the business impact the eSourcing platform gives, as the central team has to demonstrate the value of it to receive funding. Still a lot of data was collected and the data infrastructure considered critical for high level eRA performance management.

Table C.19. eRA performance management

eRA performance management	Epsilon
KPIs regarding realised savings from eRAs	Yes
KPIs regarding supplier eRA conversion	N/A
KPIs regarding internal eRA adoption	No
Data infrastructure considered critical for high level eRA performance management	Yes

C.3 Case Zeta

Zeta is a nordic construction company with five business areas. It develops commercial properties and constructs housing, offices, industrial facilities and public buildings. A large part of the business is within civil engineering and infrastructure projects such as roads, railways, tunnels and bridges. The company has a turnover of €5,16B.

C.3.1 Sourcing organisation and processes

Zeta's sourcing organisation has elements of both centralisation and decentralisation. There is a central organisation that provides category strategies and frame agreements for categories where it is fitting. But most sourcing and purchasing is done on a project level. Most of the time the frame agreements are adequate enough to buy from, but often the procurement has to be adopted to the specific needs of the project. Sourcing is a cross-functional process within Zeta and many roles work with sourcing without having an explicit sourcing role, but an overview of positions with strong sourcing profile is explained below:

- *Category managers*: In the central organisation category managers develop and maintain the strategies for the categories and their sub-categories. To help the category managers, they have a category team consisting of members from different parts of the organisation that will help explain their needs from the category in order to create an efficient cross-functional strategy. This strategy is also controlled by a second Reference Team to ensure the strategy is aligned with the group strategy. Along with the category strategies, common templates are created to ensure compliance with the operative sourcing professionals.
- *International purchaser*: The international purchasing team are individuals dispersed geographically at local purchasing offices and they continuously secure that an up to date and broad supplier base is kept. The international purchasing is a central function but the purchasers are often located in the local region of where the purchased goods are bought, having lead buyers to specialise and maintain good relationships with the suppliers and negotiate new contracts.
- *Purchasing system administrators*: A team of ten people improve and maintain the purchasing system, which is an internally developed source-to-pay system. They control the system and make sure it is kept functional.
- *Purchasing professionals*: The majority of the operative sourcing is performed by the purchasing professionals. Across the nordics they are about 300 professionals working across all business areas. They are either working within the business area or in a project and utilise the common strategies that the category managers have created.
- *Project managers*: In most of the construction projects the project managers are present during important negotiations with suppliers. The suppliers and the project manager will often have close cooperation during the project and therefore the technicalities of the specifications set by the customer in the project are discussed and negotiated over. This could be done together with the purchasing professional or not, depending on the situation.

According to the informant at Zeta there are three big differences in procurement between manufacturing and construction and those are presented in Figure C.3.

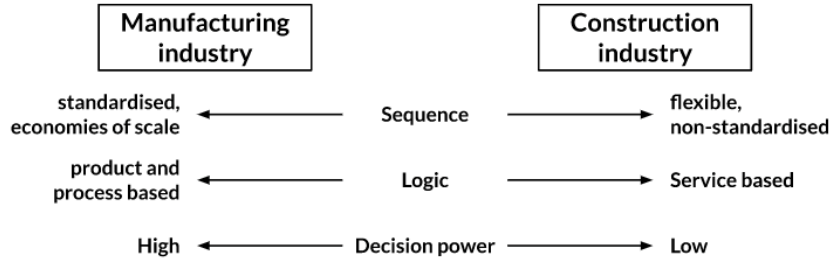

Figure C.3. Industry differences between manufacturing and construction.

Decision power is explained as who specifies the product. Manufacturing companies often own their own specifications, and even if they do not the specifications will not change overnight. In the construction industry there are often changes in use of material or blueprints might change after the customer sees the progress, this makes it important for the company to be very agile and the cooperation with the suppliers very tight. It is understood that contracts might change over time and then a lot of focus is put into relationship building with the suppliers. The project managers are very important in the sourcing process as they often want to know their suppliers and that the suppliers can deliver even if the specifications change. To repeat the sourcing process with new RFx or negotiations whenever an update is unfolding is not viable as time is crucial for the project.

Next to the decision power between manufacturing and construction is the sequence of which the product is produced, where in manufacturing efficiency often is gained through better sequencing of the production. In construction the improvements in sequencing is contextual to the project and efficiency cannot be reached through more standardised routines, especially if the customer uses their power to change the specifications the sequencing is impossible to make more efficient. Sourcing suppliers that could deliver just-in-time is extremely important in a capital heavy project as construction, but if the sequencing is not known the agility of the supplier is a factor that needs to be incorporated into the negotiations.

Lastly the logic of the industry is explained as a difference in regards between being a manufacturer or service provider. Because even though construction companies are building physical products, the very nature of the construction industry is service based. Together with the fact that the construction company does not have the decision power nor any standard sequencing, the services must then be very agile. The logic is that with changing demands the production process as well as preparations must be flexible. To adhere to these different sourcing contexts, three types of contracts exist at Zeta:

1. *Frame agreement with price list:* The most straightforward contract is the frame agreement with a call-off model. Examples would include protective workwear, rental machines or building material. The frame agreements are negotiated centrally and available for the purchasing professionals to utilise. There might be one or several suppliers available with frame agreements for a specific category and any category that has a frame agreement fitting for the project could be used.
2. *Frame agreement with project specific adjustments:* Sometimes the frame agreements do not fit the project and adjustments have to be made. Examples would include all the same categories as previously stated, and the adjustments could for example be made in the delivery times or minimum order quantities.
3. *Project specific agreements:* Any contract written outside a frame agreement is a project specific agreement. These agreements are very diverse and the contracts might be very different. The suppliers could be suppliers where there are present frame agreements but more often the contracts are negotiated with smaller suppliers where there is not an existing frame agreement to use.

The purchasing professionals have to investigate two dimensions to understand which contract to use. First the difference in project demands and then the difference in supplier base. If the project demands are simple and the supplier base is large the frame agreements are considered, but the more challenging the demands are and the narrower the supplier base is the more the other types of contracts fit. It should be noted that not all categories had frame agreements and then the project specific agreement is the only option.

C.3.2 Maturity in eSourcing utilisation

Zeta has been using eSourcing applications for almost 15 years. The informants had been working at the company for about one decade and six years respectively, but neither were present when the source-to-contract or other purchasing systems were implemented. Some

parts of their purchasing systems were internally developed by Zeta and a devoted team for maintaining and developing new features still exists.

In the system a category management module exists and the category managers use this to refine the category strategies. The category managers also produce the common templates and place them within the system in order for them to be available for the purchasing professionals. The system supported eRFx but using traditional templates and sending them via email outside of the platform was still in practice at Zeta. Depending on the category F2F negotiations were still the common practice, especially in categories where the supplier might have a better understanding of how to deliver the product and discussion were needed: e.g. installations of electricity or ventilations.

C.3.3 Important aspects of choosing sourcing approach

The first important thing to notice when choosing a sourcing approach is which type of contract to be made. The frame agreements sourced by the category managers are all done via the purchasing system, the category managers also have an own module to share common templates for the specific category within the purchasing system. From the purchasing system eRFx are sent out to suppliers and then negotiations are followed with the best bidders. For most categories frame agreements are reached with several suppliers to mitigate risk. There can be several frame agreements within every category with different suppliers to mitigate risk. Only for the non-critical categories ‘travel’ and ‘workwear’, are single sourcing used with the reasoning that if the supplier is unable to deliver an alternative is still easily procured.

But the more operative sourcing made by purchasing professionals or project managers are using different approaches not always done through the purchasing system. When the frame agreements are fit for a project's purposes these are used. Then a call-off model is used and the contact is done by email, telephone or through the eSourcing system interface. The frame agreements, sometimes with adjustments, are handled the same way. However, if there are several frame agreements in place, emails to all suppliers with the needed adjustments are sent directly by email or through the system. Sometimes further negotiations are needed, and depending on the complexity of the changes it could either be through phone calls or F2F meetings.

Project specific agreements might use different approaches. The eSourcing system could and is sometimes used in these cases. However, for the sourcing of suppliers that will work on the project it is often done in direct contact, because the people in the project will work together with the supplier and they need to build mutual trust. The project manager is often a part of this process as a way to both to establish a relationship but also to discuss the project with the specifications. The supplier is most certainly more experienced in their specialised field and the project manager wants their input in how to solve the needs of the project. However, if the project demands are simple and the supplier base is large the purchasing professionals might use an eRFx using the purchasing system or extract a category template and send out RFx.

C.3.4 Elements considered when configuring eRA processes

Zeta has deliberately chosen not to include support for eRA functionality in their eSourcing platform. In many cases the initial specifications are rarely the final, as the customer could change their opinions about the project along the way, therefore the comparability between the bidders would not be truly just. Zeta pointed out that reverse auctions were not something to perform instead of a negotiation as there are elements of soft values in negotiations which would be lost in an eRA. Instead focusing negotiation based sourcing and supplier relationships that could handle bumps along the way was prioritised rather than using static eRAs.

The indirect purchasing was discussed, as the comparability between suppliers would be easier. But this category had not been prioritised in Zeta as an area or even less somewhere to perform reverse auctions. Because the current processes with RFx and negotiations were

deemed good enough no action had been taken to improve the situation. During the interview an openness to use eRAs in indirect material was displayed.

C.3.5 Within-case analysis

At Zeta, the informants gave two different and interesting perspectives. One of the informants was the company's Chief Procurement Officer and member of the executive management board with strategic insight regarding extending beyond the purchasing domain. The other was responsible for the management of their digital purchasing systems, providing good insights on digital purchasing's differences from traditional purchasing.

Aspects of choosing sourcing approach

Zeta stood out in the company sample as a construction company, being the only company not within the manufacturing industry. In the construction industry, maintaining structured sourcing processes with standardised recommendations in terms of which sourcing approaches to use is difficult, due to the forever changing environment with short sourcing lead times and variations in purchasing specification on project level. It was clear that the sourcing system had offered the Zeta much better data management, as compared to previously. But as there seemed to be no structured use of digital sourcing approaches at Zeta, there was consequently no clearly defined expressed benefits of sourcing digitalisation either, as seen in Table C.20.

Table C.20. Expected and expressed benefits of digitalisation at the case companies.

Benefits of digitalisation	Zeta
Better data management	x
Increased supplier invitations	
Direct cost reductions	
Improved cross-functional workflow	
Process time savings	
Exploiting frontier technologies	

It should however be mentioned that Zeta's focus in regards to their digital purchasing system landscape had a big emphasis on eProcurement rather than eSourcing, as it focused on maintaining efficient call-off procedures from their flexible frame agreements. The contracts that Zeta made were either for call-offs or for specific projects, which demanded a certain type of sourcing approach. All call-offs contracts started with eRFx events and because the contracts were written with multiple suppliers they were subdue to strong market competition. The analysis from this is that the call-off contracts do not need eRA, because the cheapest product from any authorised supplier will be procured and the market competition will in the long term drive down the prices. Using eRFx is also the preferred way to communicate with several suppliers simultaneously as it helps the process being focused. The project specific contract did not seem to be handled in the system at all, instead the project leader in cooperation with purchasers contacted local entrepreneurs and signed contracts with the suppliers befitting the project at hand. The method is very traditional and has a strong focus on the supplier relationship, previous experiences with a supplier seemed to be valued highly as trust is an important factor in any project when problems arise.

To handle purchasing for these different types of project situations, the sourcing organisation is split between central and a local (project based) level, defined as a centre-led hybrid. The second informant led an internal eSourcing team which helped facilitate analyses and consulted different parts of the organisation in how to utilise the eSourcing platform. The result over time had been that the capabilities in regards to eSourcing technology had gotten well developed throughout the central category management organisation. Maintaining the data infrastructure through which eSourcing utilisation was managed, was also done by the internal eSourcing team. Zeta considered their eSourcing data infrastructure to be sufficient on the basis of overseeing the processes and managing e.g. organisational compliance.

Table C.21. Structures of conducting analysis in sourcing events.

Aspects of analytical foundation	Zeta
Organisational structure in purchasing	Centre-led hybrid
Central sourcing analyst team	x
Central category management team	x
Internal eSourcing consultant team	x
Data infrastructure	Sufficient

The difference between sourcing within manufacturing and construction companies was striking, and the learnings of understanding why gives broad insights to the aspects of choosing sourcing approaches. A fundamental principle in manufacturing sourcing is that the specifications should not alter, at least not after the supplier contract is signed. But in construction the specifications might change on a daily basis as the customer changes their mind on how the project should unfold. With this an uncertainty always exists in construction, which in large extent is handled by close partnerships and trust between buyer and suppliers to solve any problems that might arise. From this perspective, and based on the insights from the description of Zeta above, the highlighted competitive barriers from the case are highlighted in Table C.22.

Table C.22. Highlighted barriers for competitive supply market exercises.

Highlighted barrier	Zeta
Downstream bill of materials	x
Supplier certification requirements	
Lack of supply market analysis	x
Difficult supplier approval processes	
Geographically bound supplier base	x
High switching costs	
Proprietary technology, patent positions	

When implementing the eSourcing platform, and getting people to adopt its use, the eSourcing team and centrally facilitated training programs had proven very important success factors. This was especially the case, since organisational compliance was derived from understanding of the benefits of eSourcing technology, rather than a technology push by top purchasing management. In this regard, structured master-data management would prove beneficial for Zeta as well, given that it amplifies the potential benefits of the technology, as seen in Table C.23. In regards to what primary benefits Zeta wanted to bring out of eSourcing technology, it was to create a digital representation of the sourcing process and to introduce improved cross-functional interfaces to speed up e.g. decision mandates, as seen in Table C.24.

Table C.23. Methods to mitigate internal resistance to eSourcing implementation.

Methods for achieving compliance	Zeta
Dedicated eSourcing team	x
Centrally facilitated training	x
eSourcing performance management	
Master-data management	x
Internal consultants or super users	

Table C.24. Utilised eSourcing disciplines.

eSourcing focus	Zeta
Primarily sourcing process integration	x
Primarily increased supplier competition	

Important to notice is that Zeta had used eSourcing applications for the longest amount of time. With over 15 years of experience it is not strange to see that all RFx-processes are sent out as eRFx. It could also be viewed as a sign that traditional RFx are not as efficient as eRFx since after 15 years the traditional approach does not exist any longer. Equally important is to note that some sourcing processes will not be applicable to use eSourcing, but will continue to be handled directly with the supplier. The “No RFx” category will not disappear in the near future as the local project based supplier relationships will consistently need the close communication that currently only is available through F2F meetings.

Configuration elements critical to eRA success

The Zeta case did not use eRA and was kept in the case study because of their active choice to not use the eRA sourcing approach. By understanding the configuration elements that prevent them from doing so insights were found.The main reasoning behind not using eRAs were that comparability could not be ensured. This is due to the fact that demand specifications could not be determined before any project, and as the specifications were bound to change different suppliers would be more equipped to handle the changes. One of the most important configuration elements from literature was the comparability between bids and this highlights the importance of that specific element. Another perspective was that market leverage was already used and that eRAs would not be necessary. As the more simpler call-off contracts with price lists might have been available for eRAs the need for it was not there. Supply market competitiveness already exists as the suppliers provide periodic price lists and with every update it could be argued this is similar to an auction as the prices are pushed towards the market price.

The last major insight from Zeta’s decision to not use eRAs was the importance of supplier relationships. An eRA will heavily focus on the price aspect in the contract, while Zeta instead needed a flexible and trusting partnership. Even if using multivariable auctions with bonus-malus systems that awarded trusted partnerships, this was determined the wrong way of conducting business. This might not be the case in the future but as the market looks today in the construction industry this is the norm and the jeopardising of partnerships from failed auctions was not justified by the cost savings it might bring from successful auctions.