

UNIVERSITY OF TWENTE.

Faculty of Behavioural, Management and Social Sciences

Department of Technology Management and Supply

Master Thesis

Master of Science (M.Sc.) Business Administration

Purchasing & Supply Management

Indirect purchasing and supplier satisfaction: How can operative excellence be a facilitator to improve the buyer-supplier relationship?

Submitted by: Pia Schloms

1st Supervisor: Prof. Dr. habil. Holger Schiele

2nd Supervisor: Dr. Carolina Belotti Pedroso

External Supervisor: Stefan Jasper

Number of pages: 56

Acknowledgement

I would like to express my gratitude to my first supervisor, Prof. Holger Schiele for his guidance and valuable feedback throughout the writing process and the entire Master studies. Furthermore, thanks to my second supervisor, Dr. Carolina Belotti Pedroso for her comments on my work, which helped me a lot to improve my thesis in the last weeks.

Another important acknowledgment is for my colleagues from COMPANY X, specifically Stefan Jasper for the possibility to write my thesis in their department and get into contact with their suppliers for the data collection. Therefore, another thanks to all the suppliers who participated in the interviews!

Abstract

While direct purchasing has been recognised as a strategic enabler for organisations, indirect spend management is still neglected, despite accounting for up to 60% of a company's spend. Most topics in indirect procurement are concerned with cost-savings and process improvements, however the strategic implications are not clear.

This thesis investigated indirect procurement in the context of the preferred customer concept, more specifically operative excellence. The goal was to get further insights how operative excellence can increase the satisfaction of indirect suppliers. Additionally, the purchasing process has been analysed from the supplier's side, to gain a deeper understanding why certain factors are particularly relevant for them. The research has been conducted at the agricultural manufacturer COMPANY X, whose indirect suppliers have been interviewed. The results showed that indirect suppliers value different operative excellence factors than direct suppliers. Suppliers considered efficient RFQ, ordering and payment processes as important. The most mentioned issues were lack of feedback and communication in the RFQ phase, customers not following agreed processes and delayed payments. A maturity model has been developed based on the supplier's responses, translating them into a self-assessment possibility for indirect purchasing departments. Furthermore, e-procurement has shown to be a facilitator to supplier satisfaction for some suppliers, while for others it was seen as a burden. Findings indicate that the impact of e-procurement adaption on supplier satisfaction can depend on firm's resources and size. Buying firms can benefit from integrating their suppliers already in the strategy phase of new process implementations.

Keywords: Indirect purchasing, purchasing process, e-procurement, operative excellence, supplier satisfaction, maturity model

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1. While purchasing has evolved into a strategic function, indirect spend management still lacks a strategic focus

The purchasing function has evolved into a strategic function within organisations. Purchasing has developed from conducting solely operative and tactical tasks to gaining strategic relevance. Instead of only being responsible for ordering, data maintenance and inventory management, strategic tasks such as managing spend, global sourcing and suppliers have become a critical factor for a firm's success.¹ Purchasing management can help firms to gain competitive advantage as well as improve firm performance.²

Differentiations can be made between indirect/direct, project/serial, or first time/rebuy purchasing.³ While it is evident, that particularly direct purchasing has been a widely discussed topic in academia, research in indirect purchasing has so far been neglected.⁴ Studies focusing on indirect procurement are rare.⁵ Additionally, also many organisations tend to focus more on managing direct instead of indirect spend.⁶

Indirect purchasing refers to products and services which support production but are not built into the final product. There is a large variety, from consulting services, IT, to consumable goods such as tools and office supplies.⁷ Some researchers go as far to state that indirect procurement has no strategic implications, and the only target are cost-savings.⁸ This can be seen as surprising, since a typical manufacturing firm spends up to one third of their purchasing volume on indirect products and services.⁹ For non-manufacturing firms this number can increase to up to 60%.¹⁰ Indirect spend is characterised by a large number of suppliers which have to be managed and a high number of transactions.¹¹

¹ See Matthews (2005; p. 390)

² Zimmermann and Foerstl (2014; p. 45)

³ See Schiele (2019; p.52)

⁴ See Israel and Curkovic (2020)

⁵ See Niederschweiberer and Kleemann (2020; p.223)

⁶ See Helmold and Dathe (2023; p. 259)

⁷ See J.-I. Kim and Shunk (2004; p. 153)

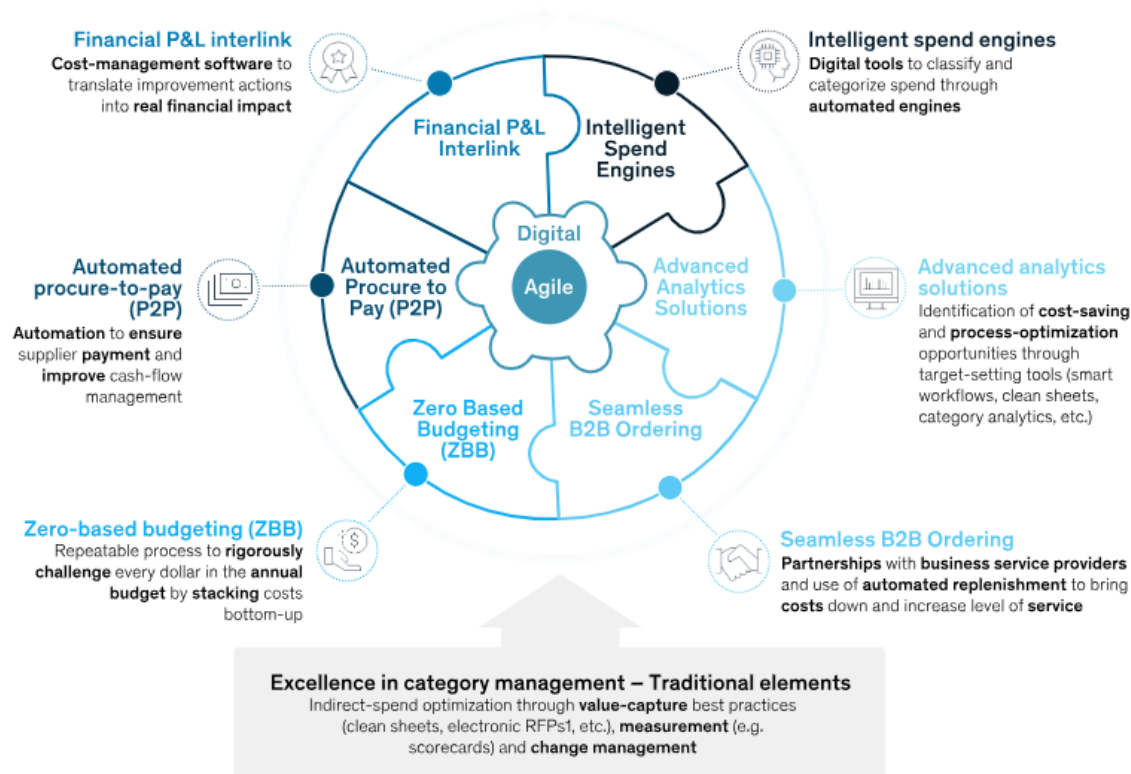
⁸ See Rafati and Poels (2017)

⁹ See de Boer, Holmen, and Pop-Sitar (2003)

¹⁰ See Yu, Mishra, Gopal, Slaughter, and Mukhopadhyay (2015; p. 1055)

¹¹ See Puschmann and Alt (2005)

The indirect procurement function revolves around six new elements.



¹Requests for proposals.

McKinsey
& Company

Fig 1: The indirect procurement function revolved around six new elements ¹²

A study conducted by (Erriquez et al., 2019); Pierre de la Boulaye (2019) for McKinsey highlights the trends in indirect procurement for the 2020's. As can be seen in Figure 1, a crucial aspect in achieving excellence in indirect procurement is the implementation of digital tools. Even though topics such as e-procurement have received wide attention in the past decades,¹³ it becomes evident that potential for improvement still exists. The relevance of B2B, P2P and other digital technologies will even increase in the next decade.¹⁴

As stated above, there is a lack of strategic focus in the indirect procurement context. The discussed topics are usually concerned with cost-savings and process improvement such as e-procurement implementation.¹⁵ Therefore, the question arises, whether management of indirect suppliers can become a strategic enabler for buying firms. One view on strategic

¹² Erriquez et al. (2019)

¹³ See Presutti (2003); Soares-Aguiar and Palma-dos-Reis (2008)

¹⁴ See Erriquez et al. (2019)

¹⁵ See Yu et al. (2015; p. 1055)

supplier management is the preferred customer concept. Suppliers can be viewed as resources to buying firms, therefore it can be argued that their management is of a strategic nature.¹⁶ Especially when resources are scarce, the right supplier management can help to secure necessary goods. Most industries worldwide currently suffer from supply disruptions and price increases, caused by a series of events, such as the Covid-19 pandemic and war in the Ukraine. The supply scarcity is challenging for purchasing professionals. The focus for many is to secure the required goods and services in order to keep the firm's operations running.¹⁷

Becoming a preferred customer to suppliers can help to receive a favoured treatment and secure supply.¹⁸ In contrary, dissatisfied suppliers might perform poorly and deliver poor quality products. This can result in a far-reaching impact in the downstream supply chain, and thus shows the importance of proper supplier management.¹⁹ As antecedents to achieve the preferred customer status, Pulles, Schiele, Veldman, and Hüttinger (2016) identify customer attractiveness and supplier satisfaction.²⁰ It is not yet determined, which factors exactly determine supplier satisfaction and how to achieve it. Various relational and economic factors are identified, one of them being operative excellence.²¹ While not one universally agreed definition for operative excellence exists, most have in common to focus on efficient processes.²² The question arises, how can firms achieve such status with their suppliers?

Vos, Schiele, and Hüttinger (2016) found that supplier satisfaction can be increased by operative excellence, particularly in the indirect procurement context. However, it is not clear, why it can increase supplier satisfaction. Operative excellence is a broad term and consists of different factors. Therefore, the goal of this research is to explore the mechanisms behind operative excellence in indirect procurement. More specifically, the aim is to understand how and why operative excellence can increase the satisfaction of indirect suppliers. This leads to the following research questions:

¹⁶ See Steinle and Schiele (2008; p. 12)

¹⁷ See Accenture (2022)

¹⁸ See Schiele (2012; p. 47)

¹⁹ See Essig and Amann (2009; p. 107)

²⁰ See Pulles et al. (2016; p.137)

²¹ See Schiele (2020; p. 130)

²² See Hüttinger, Schiele, and Schröder (2014; p. 703); See Morash and Clinton (1998; p. 106); See Schiele (2020; p. 130)

Q1: Which factors of operative excellence are relevant for supplier satisfaction in indirect procurement?

Q2a: Why can operative excellence increase supplier satisfaction in indirect procurement?

Q2b: To what extent can the implementation of e-procurement tools be a facilitator to achieve operative excellence in indirect procurement?

In order to answer those research questions, the micro processes which happen at the supplier during the purchasing process will be analysed and issues identified. Furthermore, the applicability of previous research in the indirect procurement context will be examined. The thesis starts with reviewing literature about the topics of supplier satisfaction, indirect purchasing and e-procurement and introducing the institutional theory. A maturity model will be developed and introduced. Interviews will be conducted with suppliers providing indirect products to the case company of this research. The data will be analysed, discussed and recommendations for the future will be given.

2. Literature review on indirect purchasing, e-procurement, supplier satisfaction, maturity models and the institutional theory

2.1 Despite its importance for firms' operations, indirect procurement is still neglected in practice and theory

2.1.1 Indirect procurement differs from direct procurement in terms of purchasing volume, variety of goods and predictability of demand

There are different definitions and synonyms for indirect purchasing. de Boer et al. (2003) name it non product related goods and services, defined as “[...] all goods and services other than those used in an organization’s primary operations primary operations, like raw materials, production items, and engineering, assembly or production activities, contracted to outside suppliers.”²³ According to J.-I. Kim and Shunk (2004), indirect materials “include office supplies and equipment, MRO (maintenance, repair and operation), computers, software and other IT equipment, marketing kits and services, travel reservations and other services, as well as capital goods.”²⁴ Rafati and Poels (2017) refer to indirect purchasing as buying goods and services which support a firm’s operations. Whereas product related purchasing has a strategic function and is a value adding process, this cannot be seen with indirect spend management. It is merely of tactical nature, focusing on reducing costs.²⁵ Indirect purchasing performance can be measured by the share of spend on sales. Consequently, the lower the share of spend, the better the purchasing performance is.²⁶ However, Pohl and Förstl (2011) argue that firm’s focus only on the measurements of costs and neglect other performance indicators. They argue that in order for purchasing to support the overall company’s strategy, multidimensional performance measures should be put into place.²⁷ Another performance measure is the time to order. However, the authors find relying on this measure inadequate, as it makes purchasing performance solely depending on the internal customer’s satisfaction with the ordering time.²⁸

²³ See de Boer et al. (2003; p. 911)

²⁴ J.-I. Kim and Shunk (2004; p.153)

²⁵ See Rafati and Poels (2017; p.280)

²⁶ See Tan and Goh (2017; p. 251)

²⁷ See Pohl and Förstl (2011; pp. 241 - 242)

²⁸ See Le Sueur and Dale (1998; pp. 254 - 255)

Besides the difference in the types of products and procurement processes, the skills of direct and indirect purchasers differ as well. Delke, Schiele, and Buchholz (2023) identified innovation management as a crucial skill in direct purchasing, while in indirect procurement the focus lies on change management and globalisation topics. Namely, the identified top skills were: “Change management, communication skills, flexibility and agility, cultural awareness”²⁹

While purchasing and supply management can have a positive impact of a firm’s competitive advantage through factors such as decreasing TCO, service levels and on time delivery, this mainly refers to the impact of managing direct spend. However, there is another major spend source in organisations, which is spend on indirect materials. In contrast to direct procurement, it has not yet received much attention in academia.³⁰ As argued by Israel and Curkovic (2020), properly managing indirect procurement is a crucial tool for gaining a competitive advantage. While indirect spend is an important component in the purchasing field, it has been neglected in academic research.³¹

According to Gebauer and Segev (2000), indirect procurement involves a large variety of products and services, meaning everything a firm buys that is not a direct part of the finished good. The indirect spend can be split into three categories.³²

1. MRO (Maintenance, Repair and Operations)
2. Complex products and investments
3. Services

Most attention lies in examining and researching direct purchasing, however a considerable amount of firm’s turnover is spent on “non product related goods and services (NPR)”³³, as defined by de Boer et al. (2003). Large, manufacturing organisations spend around 30% of their revenue on their indirect suppliers.³⁴ While indirect procurement typically accounts for a large number of transactions and has a large number of suppliers, the value of the individual purchase orders is often low. Therefore, tools such as e-procurement can support indirect purchasing for more operational efficiency.³⁵

²⁹ See Delke et al. (2023; p.16)

³⁰ See Cox, Chicksand, Ireland, and Davies (2005; p.39)

³¹ See Israel and Curkovic (2020; p.775)

³² See Gebauer and Segev (2000; p.109)

³³ See de Boer et al. (2003; p.911)

³⁴ See de Boer et al. (2003; p.911)

³⁵ See Puschmann and Alt (2005; p. 130)

Summarising these definitions, indirect spend involves all expenses to suppliers which keep the company's operations running. Those can be split into materials and services and include spare parts, machines, procurement of IT or marketing services. It shows that indirect spend is responsible for a large variety of goods. It is important to note that the distinction of indirect and direct materials might differ between organisations and their business focus, which might also be an explanation on the lack of research done so far.³⁶

2.1.2. Maverick buying, a common problem in indirect procurement

“Maverick buying is the non-compliant, off-contract buying of goods and services, for which an established procurement process is in place based on pre-negotiated contracts with selected suppliers.”³⁷ Simply said, maverick buying is the outcome of purchases which individuals perceive as more desirable or faster and do not follow given processes.³⁸ Maverick buying refers to spend which is not carried out by the purchasing department, but other individuals within the organisation.³⁹ It is still not studied in-depth in academic research.⁴⁰ What is known, is that Maverick buying is faced more in the context of indirect spend rather than direct spend.⁴¹ This statement is also confirmed by Scott, Burke, and Szmerekovsky (2018) who claim that the Maverick buying phenomenon is more known and researched in the indirect procurement context. They studied whether Maverick buying is a relevant topic in direct procurement. Findings show that Maverick buying occurs in direct purchasing as well, the reasons for that often lie in the experience and level of training of the purchaser.⁴² Graven identifies multiple reasons why Maverick buying can be harmful to organisations. These include higher product and order costs, lack of legal frameworks and reporting possibilities and invoicing. They also researched reasons for the occurrence of Maverick buying, which are lack of knowledge/awareness, lead times, inefficient ordering processes and bad quality.⁴³

Different reasons for Maverick buying have been identified by Katri Karjalainen et al. (2009b). There might be a lack of frameworks and processes or individuals are not able to use them. Another reason can be the pursue of own interested or lack of willingness to adapt

³⁶ See Niederschweiberer and Kleemann (2020; p.223)

³⁷ See K. Karjalainen and van Raaij (2011; p. 185)

³⁸ See Kampik and Hilton (2019; p. 3)

³⁹ See Katri Karjalainen, Kemppainen, and Van Raaij (2009b; p.245)

⁴⁰ See Holma and Bask (2012; p.4)

⁴¹ See Katri Karjalainen et al. (2009b; p. 251)

⁴² See Scott et al. (2018; pp. 51-52)

⁴³ See Graven (pp.52-53)

to new processes. Lastly, employees might be convinced to have a superior product knowledge or skills over the purchasing department.⁴⁴ Indirect procurement processes are prone to a lack of transparency because the spend is scattered across categories, business units and locations.⁴⁵

Rothkopf and Pibernik (2016) analysed Maverick buying through the lense of the Principal Agent theory. They argue that instead of monitoring and aiming to eliminate Maverick buying, firms should leverage the knowledge of their “agents”. This means to give them the opportunity to act outside of contracts by providing a framework to justify alternative supplier choices.⁴⁶ A way to counteract maverick buying is by increasing the number of frame agreements within organisations. Frame contracts can help to increase spend visibility, which results in in a decrease of costs and risk.⁴⁷ Related to that, implementing e-procurement solutions for MRO articles can be a lever to decrease.⁴⁸ It should be noted, that Maverick buying does not only occur with MRO articles, it is just as relevant in purchasing of services. The occurrence in purchasing of traveling services can be mitigated by providing guidance and support to users and using a travel management system. This helps to ensure that only the contracted suppliers are selected and lowest prices chosen.⁴⁹ Besides that, training has shown to be an effective measure against maverick buying. However, here the effectiveness depends on the motive and is most helpful when maverick buying is caused by lack of knowledge.⁵⁰

2.1.3. MRO procurement is characterised by high volume/low value purchases

As described in the previous chapter, part of indirect purchasing or non-product related purchasing, is MRO (Maintenance, Repair & Operations) expenditure. While it depends on the company and industry, MRO typically includes tools, office supplies, spare parts, lubricants, oils and other consumables.⁵¹ Particularly early research uses MRO as a description of all indirect spending.⁵² Barry, Cavinato, Green, and Young (1996) suggest that MRO accounts for a large part of purchasing activities, while only having a small share

⁴⁴ See Katri Karjalainen et al. (2009b; p.257)

⁴⁵ See Glas and Kleemann (2016; p.224)

⁴⁶ See Rothkopf and Pibernik (2016; p. 88)

⁴⁷ See K. Karjalainen and van Raaij (2011; p. 185)

⁴⁸ See de Boer, Harink, and Heijboer (2002; p.32)

⁴⁹ See Holma and Bask (2012; p.13)

⁵⁰ See K. Karjalainen and van Raaij (2011; p. 195)

⁵¹ See Bechtel and Patterson (1997; p.19)

⁵² See Israel and Curkovic (2020; p. 776)

of total purchasing spend and pose one of the least strategic areas in procurement.⁵³ This is in accordance with Kwon, Yang, and Rowley (2009) who state that MRO articles are characterised by a high volume of purchase orders, typically each with a low value. In addition to low value high volume items, Yu et al. (2015) consider specialised goods and certain services as MRO as well.⁵⁴ Additionally, MRO is mainly based on spot buying, which makes it difficult to forecast demand.⁵⁵ The topic of MRO purchasing is still understudied in literature.⁵⁶ While the possibilities of e-procurement for increasing efficiency in MRO procurement processes has been discussed, it is not clear how these systems should be implemented.⁵⁷ This paper will follow the definition of MRO articles being articles such as tools and office suppliers, which are not part of the final product and excludes service as part of MRO.

Cardoso and Biazzin (2020) examined drivers and barriers for convincing suppliers to adapt e-procurement solutions. Suppliers who have the resources and capabilities for e-procurement implementation show higher willingness for adoption. Furthermore, a strong relationship with customers increases the willingness for e-procurement adoption, due to the relatively large investment.⁵⁸ Looking at the buyer's side, the implementation success of e-solutions for MRO articles largely depends on acceptance of organisational members. Since the demand arises from different departments within the organisation, it is important to gain organisation wide acceptance. When the usage frequency is low, increasing acceptance can support to intensify usage.⁵⁹ Issues associated with MRO procurement are the missing standardisation as well as disregard of rules and policies.⁶⁰

Digital applications such as EDI, can bring organisations cost and time savings in MRO procurement.⁶¹ Managing this, however, requires resources and new responsibilities for purchasers. This includes continuously updated information, workflow management and integration into the organisation's systems.⁶² While digitalisation plays a large role in indirect purchasing, a new recent development, namely Industrie 4.0 has so far received little

⁵³ See Barry et al. (1996; p.36)

⁵⁴ See Yu et al. (2015; p. 1054)

⁵⁵ See Kwon et al. (2009; p. 108)

⁵⁶ See Croom (2000; p.4)

⁵⁷ See Yu et al. (2015; p.1054)

⁵⁸ See Cardoso and Biazzin (2020; p.293)

⁵⁹ See Khuan and Swee (2018; p. 46)

⁶⁰ See Le Sueur and Dale (1998; p.254)

⁶¹ See Foroughi (2008; p.2)

⁶² See Foroughi (2008; p.6)

attention in this context.⁶³ Industrie 4.0 deals with topics such as Big Data, Artificial Intelligence and Cloud solutions. There are expectations that the degree of autonomisation in purchasing processes can increase with the usage of Industrie 4.0 applications. However, results show also that a large part sees no significant impact of these solutions on indirect purchasing in the future.⁶⁴

2.2 Purchasing processes can benefit from implementing e-solutions

2.2.1 The purchasing process consists of strategic sourcing and operative procurement

To allow answering the research questions in a structured manner and analyse processes at the supplier, the different steps of the purchasing process should be understood. In practice, purchasing process models are used for standardizing and monitoring purchasing activities.⁶⁵

A large variety of purchasing process models exist in literature. They all focus on different purchasing topics, such as displaying operative or/and strategic purchasing processes or supplier management. A comprehensive model covering all areas in detail is still missing.⁶⁶ Purchasing can be divided into operative, tactical and strategic activities. Operative tasks are sometimes more neglected and have a negative connotation. Nonetheless, all purchasing activities contribute to some degree to an organisation's success. Solely focusing on strategic tasks will not necessarily lead to a competitive advantage.⁶⁷ Fig. 2 displays the entire purchasing process. It can be separated into strategic and operative tasks, for which both the purchasing department is responsible. Strategic sourcing consists of planning, selecting and contracting, while operative procurement means ordering, expediting and paying.⁶⁸ Puschmann and Alt (2005), also separate the procurement process into strategic and operative procurement. As strategic procurement they identify specification, planning, selecting, quotation (RFQ), assessing and negotiating. Operative procurement includes sourcing, purchase requisition and ordering, delivery and receipt as well as paying.⁶⁹

⁶³ See Niederschweiberer and Kleemann (2020; p. 230)

⁶⁴ See Niederschweiberer and Kleemann (2020; p.231)

⁶⁵ See Bäckstrand, Suurmond, van Raaij, and Chen (2019; p. 1)

⁶⁶ See Bäckstrand et al. (2019; p. 6)

⁶⁷ See Rozemeijer (2008; p. 205)

⁶⁸ See Schiele (2019; p. 48)

⁶⁹ See Puschmann and Alt (2005; p. 129)

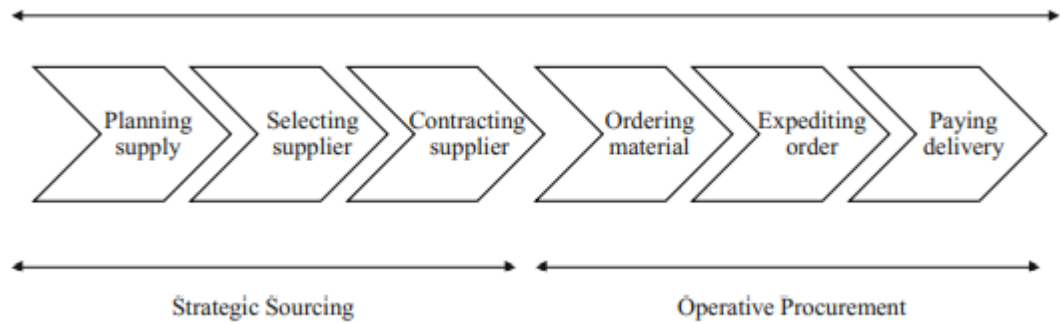


Fig. 2: Strategic sourcing and operative procurement (Schiele, 2019; p. 48)

The first stage of strategic sourcing is the planning of supply. This depends on the initial situation. Schiele (2019) describes multiple situations, such as direct/indirect procurement, serial/project purchasing and the novelty of the product.⁷⁰

After that, a suitable supplier will be selected. The supplier selection process can look different, depending on the type of demand, usually RFQs are issued. Generally, this includes requesting and comparing supplier offers. Next to established criteria like price, recent research suggests that factors such as supplier's reputation also play a role in the supplier selection process.⁷¹

Following the supplier selection, contracting is the next step. A crucial part for contract management is proper record keeping of the documents, ideally stored centrally to ensure easy accessibility.⁷² Katri Karjalainen et al. (2009b), also highlight the importance to store contracts digitally and make them accessible within the organisation. The accessibility of contracts can help to reduce maverick buying,⁷³ which means that the order creation is not made by the purchasing department, but directly by the requester in the organisation.⁷⁴

This leads to the next steps, which are the order execution and expediting. Here, the operative part of the procurement process begins, where orders are placed and tracked. The order execution depends on the material which is bought. For one time demands, the order might be created manually. For serial products, automatic systems are often put in place, which reorder once the stock goes below a certain level.⁷⁵

⁷⁰ See Schiele (2019; p. 52)

⁷¹ See Manello and Calabrese (2019; pp. 6-7)

⁷² See Appiah and Lartey (2019; p.22)

⁷³ See Katri Karjalainen et al. (2009b; p. 257)

⁷⁴ See Schiele (2019; p. 48)

⁷⁵ See Schiele (2019; p. 58)

The last part of operative procurement is the payment. Usually, after a defined period of the delivery, the payment is conducted. A typical agreement is a discount if the payment is done before the contracted date.⁷⁶

2.2.2 E-solutions can support the operative and strategic purchasing stages

“Electronic procurement, commonly referred to as e-procurement, can be defined as the automation of an organisation’s procurement processes using web-based applications”⁷⁷

Many e-solutions exist in the procurement context. According to Wagner and Essig (2006), a distinction needs to be made between e-marketplaces and e-catalogues, in particular with regards on the effect of the buyer-supplier relationship. An e-catalogue usually contains products of only one supplier. Therefore, if buying firms use catalogues, it is more likely to reduce the number of suppliers. In contrast to that, e-marketplaces offer products of multiple suppliers and offer a wide range of products from many sources. This type of e-solutions is more likely to increase the number of suppliers for the buying firm. Summarising, catalogues can enhance the buyer-supplier relationship as it can be seen as a commitment to collaborate between the two firms. Marketplaces, however, are focused on achieving cost savings and do not improve the relationship.⁷⁸

The wide applications of e-procurement for the purchasing process are also identified by Waithaka and Kimani (2021), namely “Informing, e-Tendering, e-Auctioning, vendor management, catalogue management, Purchase Order Integration, Order Status, Ship Notice, e-invoicing, e-payment, and contract management.”⁷⁹

Planning supply	Selecting supplier	Contracting supplier	Ordering material	Expediting order	Paying delivery
AI for analysing and segmenting spend,	e-tendering, e-auctioning (Waithaka & Kimani, 2021)	Central digital storage, organization wide	Order placement, Auto – replenishment	Order integration, Order status, ship notice (Waithaka	e-invoicing (Cuylen, Kosch, & Breitner, 2016)

⁷⁶ See Kingsman (1983; p. 1086)

⁷⁷ Nawi, Roslan, Salleh, Zulhumadi, and Harun (2016; p. 329)

⁷⁸ See Wagner and Essig (2006; p. 457)

⁷⁹ Waithaka and Kimani (2021; p. 33)

determining demands (Allal-Chérif, Simón-Moya, & Ballester, 2021)		accessibility (Katri Karjalainen et al., 2009b) AI for contract management (Allal-Chérif et al., 2021)	(Schiele, 2019) e-marketplace, e-catalogue (Wagner & Essig, 2006)	& Kimani, 2021)	e-payment (Waithaka & Kimani, 2021)
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Table 1: Summary of e-procurement solutions for the different purchasing stages

In general, e-procurement systems are favoured by larger firms. Considering the costs connected with the implementation, the cost benefit comes when firms have high volume purchases.⁸⁰ As highlighted by Smadi and Ababneh (2018), e-procurement adoption depends on the firm's resources. Their findings show that company's which have the necessary IT infrastructure are more likely to implement e-procurement.⁸¹ When looking at the supplier's side, also here firms with larger resources are more willing to implement e-solutions with their customers. If a supplier does not have the resources for implementation, but the purchasing organisation wants to implement such a system, then support from the buyer's side is needed.⁸²

According to Allal-Chérif et al. (2021) AI supports the procurement function mainly by increasing automation and improving processes. In practice, this refers to: analysis and segmentation of spend, improving the procurement process from demand to final payment, tracking of KPIs, contract management and quality topics.⁸³

E-procurement has been widely adopted by firms in the last decades, however, their implementation results of the systems is still not satisfying.⁸⁴ As the literature reviewed in this thesis showed, the topic of e-procurement is not new and has received increased attention in the past 20 years. However, the actual implementation in organisations does not always

⁸⁰ See Nawi et al. (2016; p. 332)

⁸¹ See Smadi and Ababneh (2018; p. 9)

⁸² See Min and Galle (2003; p. 232)

⁸³ See Allal-Chérif et al. (2021; p. 70)

⁸⁴ See Brandon-Jones and Kauppi (2018; p. 22)

the state of the art. While in large organisations more than 75% have implemented e-procurement solutions, in smaller firms less than 50% have implemented them.⁸⁵ While the topics of strategic purchasing and e-procurement have individually gained attention in literature, their combined impact on firm performance has not.⁸⁶

Utilisation of e-solutions can also positively impact strategic procurement. The reason for is the potential time reduction of operative tasks, which allow purchasers to focus on strategic topics. Overall, e-procurement can have a positive impact on operational and financial performance as well as SCM.⁸⁷

Academic findings show, that inter organisational IT solutions can be grouped into transaction focused and collaboration focused solutions. The former refers to enhancing process efficiency, while the latter is concerned with relational aspects between buyer and supplier.⁸⁸

Baglieri et al. (2007) examined the impact of introducing a supplier portal on the buyer supplier relationship. While there was evidence that a supplier portal positively affects the relationship, there was a discrepancy between buyer and supplier regarding process improvements. It should be considered that utilisation of a supplier portal requires resources from the supplier as well. As large suppliers might have multiple customers with such portals, or are small suppliers with lesser resources, in both cases the supplier needs to invest resources.⁸⁹ The willingness of e-procurement adoptions depends on the relationship between buyer and supplier, as well as the required invested resources.⁹⁰

The usage of e-procurement systems depends on the industry. While large-scale industries with standardised processes, such as automotive have widely implemented e-procurement, this is not the case for industries with individualised and diverse operations.⁹¹

Invoices can also be processed automatically with e-invoicing tools. While different solutions exist, those which require high integration are mostly worthwhile if many invoices are processed.⁹²

⁸⁵ See Niederschweiberer and Kleemann (2020; p.234)

⁸⁶ See M. Kim, Suresh, and Kocabasoglu-Hillmer (2015; p.9)

⁸⁷ See M. Kim et al. (2015; p.10)

⁸⁸ See Baglieri, Secchi, and Croom (2007; p. 1015)

⁸⁹ See Baglieri et al. (2007; pp. 1014-1015)

⁹⁰ See Cardoso and Biazzin (2020; p.16)

⁹¹ See Zunk, Marchner, Uitz, Lerch, and Schiele (2014; p. 19)

⁹² See Cuylen et al. (2016; p. 125)

Niederschweiberer and Kleemann (2020) studied the use of digitisation and Industry 4.0 applications in the context of indirect procurement. Their findings indicate that in the indirect purchasing context technologies which enable a large degree of process automation are perceived as the most useful.⁹³

2.3 Being a preferred customer can help to gain a competitive advantage

2.3.1 Supplier satisfaction and customer attractiveness for achieving preferential treatment

The preferred customer concept focuses on the buyer to become an attractive customer to its suppliers and satisfy them for gaining preferential treatment. It is a contrary view to the widely known, customer-centred marketing approach. Instead of satisfying the customer, the focus of being a preferred customer is on the buyer wanting to satisfy the supplier.⁹⁴ Achieving supplier satisfaction can be seen as a tool in successful supplier management.⁹⁵

Nollet, Rebolledo, and Popel (2012) define the concept as follows: “A preferred customer is a purchaser (buying organization) who receives better treatment than other customers from a supplier, in terms of product quality and availability, support in the sourcing process, delivery or/and prices.”⁹⁶ A similar definition has been given by Steinle and Schiele (2008): “A firm has preferred customer status with a supplier, if the supplier offers the buyer preferential resource allocation. [...] A supplier may dedicate its best personnel to joining new product development, customise its products according to the customer’s wishes, offer innovations or even enter into an exclusivity agreement. The supplier might also ensure privileged treatment if bottlenecks occur [...].”⁹⁷

In contrast, “[...], an unsatisfied supplier may produce poor quality output that lowers the quality of a buyer’s products and thus influences the buyer’s sale volumes and profitability.”⁹⁸

The focus of the satisfaction construct lies in the relational aspect between buyer and supplier. By being a preferred customer, buying firms not only get access to the product, but

⁹³ See Niederschweiberer and Kleemann (2020; p. 238)

⁹⁴ See Schiele, Calvi, and Gibbert (2012; p.1178)

⁹⁵ See Essig and Amann (2009; p. 107)

⁹⁶ Nollet et al. (2012; p. 1187)

⁹⁷ See Steinle and Schiele (2008; p. 11)

⁹⁸ Essig and Amann (2009; p.107)

all related information and services. Hence, receiving valuable information and having aligned processes are among the benefits of maintaining a good relationship with suppliers.⁹⁹ Pulles et al. (2016) identify customer attractiveness and supplier satisfaction as antecedents for gaining the preferred customer status, both having a different effect on the relationship. The role of customer attractiveness is mostly relevant for imitating the relationship, while supplier satisfaction plays a larger role in the existing relationship. That means that being an attractive customer does not have result in preferential treatment, particularly not if the supplier is not satisfied.¹⁰⁰

According to Weller, Pulles, and Zunk (2021), benefits of supplier satisfaction in buyer supplier relationships are, “[...] better pricing, improved access to physical resources and more proactive behaviour.”¹⁰¹

Alghababsheh and Gallear (2020) examine the buyer supplier relationship from a social capital perspective. Exchanging social capital between buyer and supplier can positively impact the relationship in terms of knowledge exchange and risk management. However, risks can arise as well, such as a negative impact on operational performance and rationality.¹⁰²

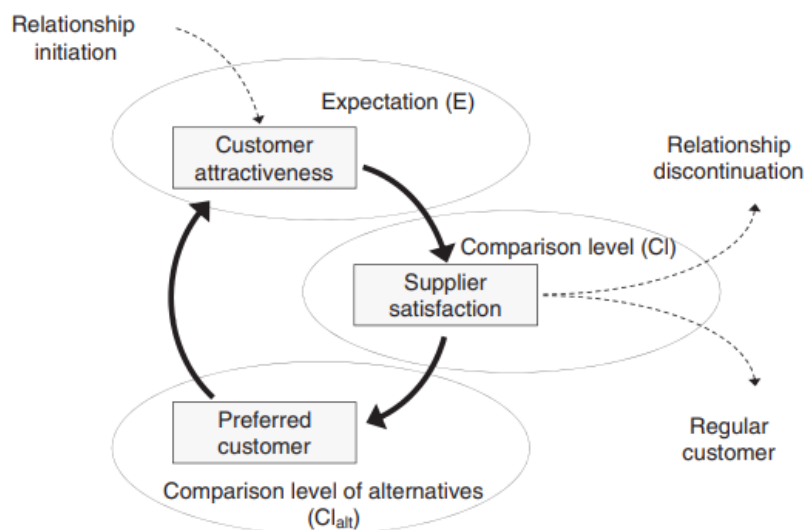


Fig. 3: The cycle of preferred customership (Schiele et al., 2012; p. 1180)

⁹⁹ See Baxter (2012; p. 1250)

¹⁰⁰ See Pulles et al. (2016; p. 137)

¹⁰¹ Weller et al. (2021; p. 9)

¹⁰² See Alghababsheh and Gallear (2020; pp. 345-345)

Two identified antecedents of customer attractiveness are: 1. The extent to which the buyer supplier relationship is managed proficiently; 2. The degree of visibility between both parties.¹⁰³

Piechota, Glas, and Essig (2021) question the dominating focus of on social aspects in the context of supplier satisfaction research. They highlight relevance of economic factors in business relationships between buyer and supplier. Social as well as economic factors play a relevant role in the buyer supplier relationship and can reinforce each other. Nonetheless, the economic factors prove to be dominant.¹⁰⁴ In line with that, Ghijsen, Semeijn, and Ernstson (2010) found evidence for the importance of capital investments to increase supplier satisfaction, such as providing capital for tooling and equipment. However, their findings also show that development efforts from the social perspective did not increase supplier satisfaction.¹⁰⁵ Glavee-Geo (2019) distinguishes between economic and non-economic supplier satisfaction and highlight the importance of both. He found evidence that supplier development has a significant effect on both dimensions of supplier satisfaction.¹⁰⁶

2.3.2 Operational excellence is among the antecedents of supplier satisfaction

2.3.2.1 Multiple definitions for operative excellence exist in different literature streams

The term operative excellence can be found in many different literature streams and no commonly accepted definition exists yet.¹⁰⁷ In the fields of production and quality management, plenty of research can be found on operational excellence, with an emerging focus on sustainability.¹⁰⁸

While an increasing attention among researchers can be noted, it is not clear how operational excellence is defined.¹⁰⁹ Sony (2019) define operational excellence as “[...] organizations making improvements to attain a competitive advantage.”¹¹⁰ Mikalef, Pateli, Batenburg, and Wetering (2015) view operational excellence from the suppliers’s side, more specifically

¹⁰³ See Patrucco, Luzzini, Moretto, and Ronchi (2019; p. 360)

¹⁰⁴ See Piechota et al. (2021; p. 12)

¹⁰⁵ See Ghijsen et al. (2010; p. 22)

¹⁰⁶ See Glavee-Geo (2019; p. 9)

¹⁰⁷ See Found, Lahy, Williams, Hu, and Mason (2018; p. 1024)

¹⁰⁸ See Carvalho, Sampaio, Rebentisch, Carvalho, and Saraiva (2019); Dev, Shankar, and Qaiser (2020); Sony (2019)

¹⁰⁹ See Jaeger and Matyas (2016; p. 289)

¹¹⁰ Sony (2019; p. 67)

highlighting the importance of offering competitive products and services and providing convenience to their customers.¹¹¹ Other authors define three levels of operational excellence, namely the strategic, tactical and operative. On a strategic level, it involves topics such as supply chain reengineering. The tactical level means the standardisation of processes in the supply chain and the operative level focuses on solving specific problems, e.g. improving delivery schedules.¹¹²

There is limited research about operational excellence in the purchasing context, however in the last years the attention is increasing. Mikalef et al. (2015) examined the link between a company's strategy and purchasing alignment. The findings show that purchasing repetitiveness as well as contract binding are requirements for purchasing alignment. This means, that the purchasing function can support achieving operational excellence by having integrated processes with their core suppliers. This can lead to lower process costs and reduce lead times.¹¹³ According to Schiele (2020), operative excellence is a crucial aspect in supplier satisfaction research. He describes operative excellence as high quality processes, which allow smooth and efficient exchanges between companies.¹¹⁴ Hüttinger et al. (2014) define operative excellence as: “[...] the supplier's perception that the buying firm's operations are handled in a sorrow and efficient way, which facilitates the way of doing business for the supplier.”¹¹⁵

Summarising, while the benefits of operational excellence are plenty, a common definition is lacking. Operational excellence has been identified as an antecedent of supplier satisfaction, but it is not clear what that entails and how operational excellence can be achieved. Considering the context of this thesis, the definition established in supplier satisfaction research according to Hüttinger et al. (2014) appears to be the most suitable.

2.3.2.2. Operative excellence is particularly relevant in indirect purchasing processes
As previously stated, operative excellence is relevant in supplier satisfaction research. It is an antecedent to achieving increasing supplier satisfaction and eventually achieving the preferred customer status. The previous chapters showed, that many authors focus on topics

¹¹¹ See Mikalef et al. (2015)

¹¹² See Morash and Clinton (1998; p. 106)

¹¹³ See Mikalef et al. (2015; p. 338)

¹¹⁴ See Schiele (2020; p. 130)

¹¹⁵ See Hüttinger et al. (2014; p. 703)

around efficiency and savings when speaking about indirect procurement, for example Rafati and Poels (2017). Rozemeijer (2008) criticizes the sole focus on strategic and negligence of operative purchasing tasks in academia. He states, that operative procurement is the foundation of the business. In fact, focusing on operative processes between buyer and supplier can become a strategic enabler in itself.¹¹⁶

Therefore, the connection of indirect purchasing with operative excellence seems even more relevant and will be further explored in this paper. While operative excellence generally is of a operative or tactical nature, viewing it from the preferred customer concept brings it more to a strategic level. Vos et al. (2016) replicated the supplier satisfaction study in the indirect procurement context. As shown in Fig. 4, they investigated the effect of the different antecedents on supplier satisfaction while differentiating between direct and indirect procurement. The results show that growth opportunity, reliability and profitability have a positive effect on supplier satisfaction.¹¹⁷ Furthermore, it is indicated that in indirect procurement, especially operative excellence has a positive influence on supplier satisfaction.

¹¹⁶ See Rozemeijer (2008; p. 206)

¹¹⁷ See Vos et al. (2016; p. 4618)

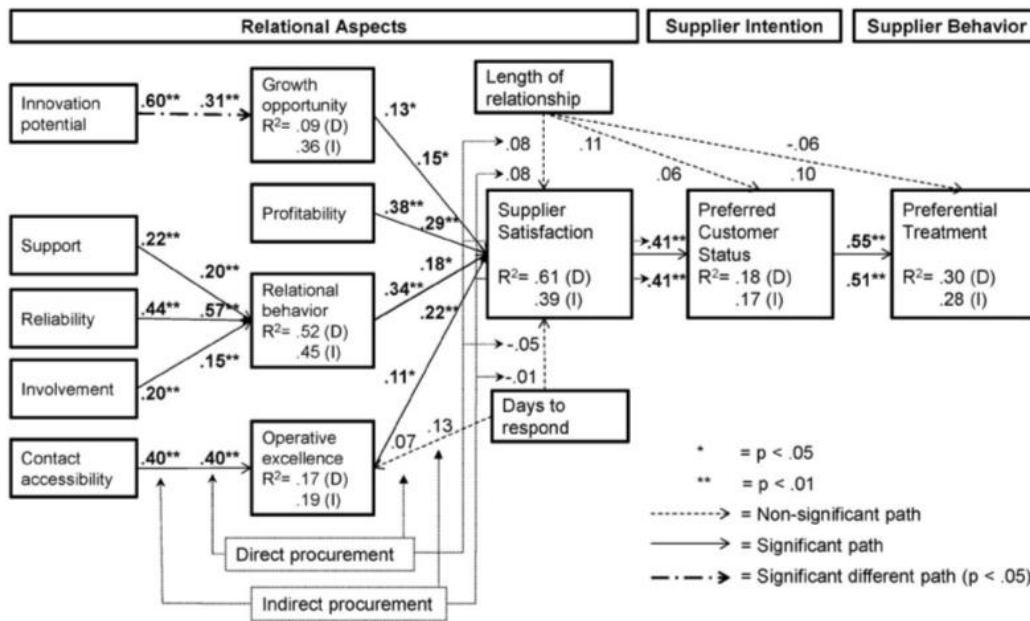


Fig. 4: Results of the revised supplier satisfaction model (Vos et al., 2016; p. 4620)

Essig and Amann (2009) conduct a supplier satisfaction study with suppliers mainly providing indirect products. They distinguish the operative level of supplier satisfaction as ordering, billing and delivery.¹¹⁸ Hüttinger et al. (2014) define operational excellence from the supplier's perspective, meaning that the buyer's operations are handled efficiently, easing the way to conduct business.¹¹⁹ Furthermore, they highlight the importance of forecasting. Providing suppliers with reliable forecasts can increase the degree of their attractiveness as customers.¹²⁰ Implementing e-procurement solutions can support to achieve operational excellence in purchasing.¹²¹ According to Schiele (2012), particularly for highly competitive suppliers, buying firms can increase their attractiveness by initiating processes for improving operational excellence.¹²²

Ilkay (2019) investigates second tier antecedents of supplier satisfaction in the context of operative excellence. The research was carried out in the defence industry. Results showed

¹¹⁸ See Essig and Amann (2009; p. 106)

¹¹⁹ See Hüttinger et al. (2014; p. 703)

¹²⁰ See Hüttinger et al. (2014; p. 712)

¹²¹ See Smadi and Ababneh (2018; p. 9)

¹²² See Schiele (2012; p. 49)

that quality of processes and demand forecasting had a positive effect on supplier satisfaction. Ordering process, payment did not show significant results.¹²³

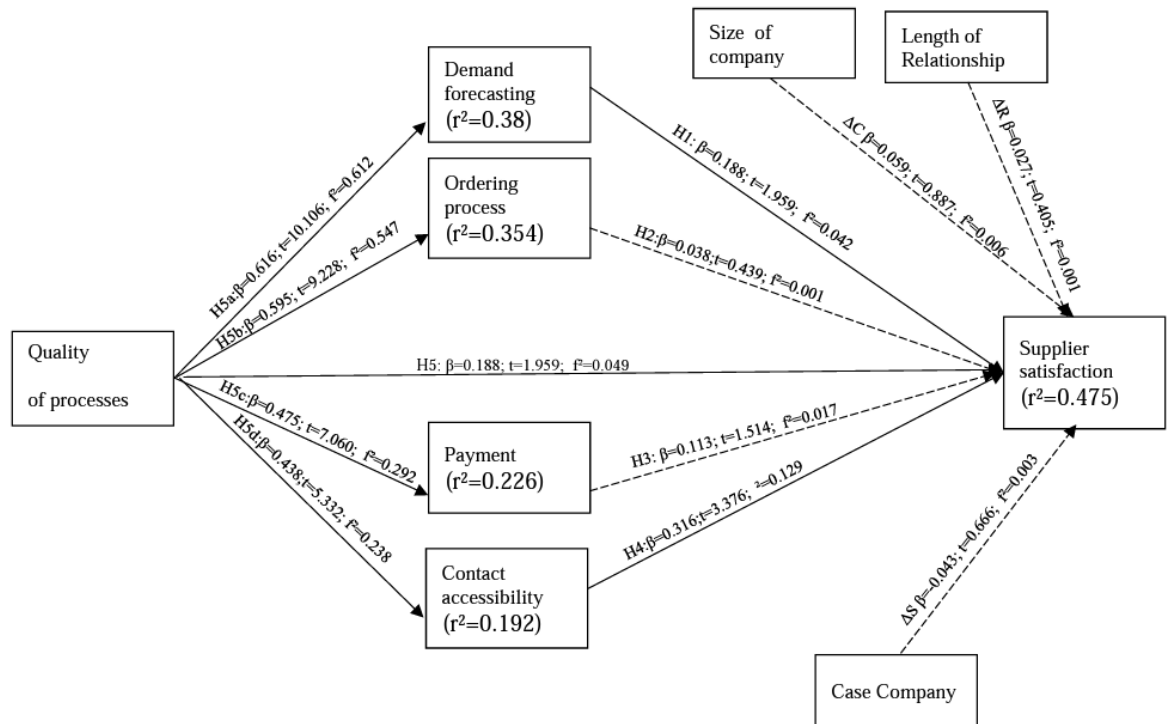


Fig. 5: Operational antecedents for supplier satisfaction (Ilkay, 2019; p. 44)

2.4 Maturity models can provide guidance and a roadmap for improvement to purchasing

“A maturity model consists of a sequence of maturity levels for a class of objects. It represents an anticipated, desired, or typical evolution path of these objects shaped as discrete stages. Typically, these objects are organizations or processes.”¹²⁴ Schiele (2007) developed a maturity model, assessing each criterion in 4 stages, from 0 – 100%. The model widely covers purchasing topics, from planning, to organisation, strategy, supplier relationships, HR and controlling. Those are split into sub-categories, with each category having assigned questions. Based on the answer, the maturity level can be identified.¹²⁵

The research of Schiele (2007) identified a strong link between purchasing maturity and absorptive capacity. It means that a purchasing department is more likely to realise

¹²³ Ilkay (2019; p. 44)

¹²⁴ Becker, Knackstedt, and Pöppelbuß (2009; p. 213)

¹²⁵ See Schiele (2007; p. 284 ff.)

improvements if their organisation has a higher maturity.¹²⁶ This maturity model has been adapted to different topics over the past year, for example e-procurement maturity in an organisation¹²⁷, maturity of e-procurement solutions on the market¹²⁸ or purchasing innovation maturity¹²⁹ Other researched topics are maturity of purchasing sustainability¹³⁰ or digitalisation.¹³¹ According to Seyedghorban et al. (2020) a higher maturity in supply chain digitalization can support the evolution from purchasing as an administrative to a strategic function. Usage of different technologies can improve intra and inter-organizational collaboration and improve transparency and visibility. They also highlight the challenges of digitalisation, which is still a relevant topic. Obstacles can occur due to lack of support in the organization structure, or lack of knowledge, capacities and capabilities.¹³²

Criticism for many maturity models is their lack of empirical testing.¹³³ Liinaharja and Kaipia (2023) developed a maturity model in their thesis specifically for indirect procurement. It considers many different models which have been developed in the past years and attempts to provide a detailed tool for analysis. Úbeda et al. (2015) examine the link between operative/strategic purchasing activities and purchasing maturity. There was strong evidence connecting high purchasing maturity to more strategic purchasing activities. Those strategic purchasing activities show potential for cost-savings.¹³⁴ Batenburg and Versendaal (2008) found a strong link between an organisation's performance and their maturity level based on six dimensions, namely strategy, technology, process, information, control and organization. Practically, organisation should use maturity assessment tools to determine their own strength and weakness and derive a strategy and action for improvement.¹³⁵ While a large extent of research is focusing on connectivity and the inter-company maturity, the role of intra-company purchasing maturity is still lacking attention in literature.¹³⁶ Internal purchasing maturity is in particular relevant for indirect purchasing, since most demands arise from individuals or departments throughout the organization.

¹²⁶ See Schiele (2007; p. 281)

¹²⁷ See Morsinkhof (2018)

¹²⁸ See Ströhnisch (2019)

¹²⁹ See Kappert (2020)

¹³⁰ See Schweiger (2014; p. 540)

¹³¹ Seyedghorban, Samson, and Tahernejad (2020)

¹³² See Seyedghorban et al. (2020; p. 1691)

¹³³ See Úbeda, Alsua, and Carrasco (2015p. 283)

¹³⁴ See Úbeda et al. (2015; p. 183)

¹³⁵ See Batenburg and Versendaal (2008; p. 10-11)

¹³⁶ See Van Poucke, van Weele, and Matthyssens (2014; p. 1)

2.5 Institutional theory – Process implementation due to pressure?

The institutional theory has its origin in sociology, politics and economics. It deals with the question why organisations adapt to each other and act the same. The reasons are pressures, caused by external or internal stakeholders.¹³⁷ According to DiMaggio and Powell (1983) three different types of pressures exist, coercive, mimetic and normative.¹³⁸ The result is so called isomorphism due to firms adapting the same norms and standards.¹³⁹ Coercive isomorphism is the result of external pressures and seeking for legitimacy, organisations adapt because of their dependency on others. Mimetic isomorphism means that organisations imitate each other because this appears as a safe way to achieve success. Lastly, normative isomorphism is rooted in the similarity of values, practices, education and habits among organisations and institutions.¹⁴⁰

Critics of the institutional theory highlight the oppressive and dominant view as opposed to viewing external interactions and productive and meaningful.¹⁴¹ Other research states that the institutional theory has gone through a shift, from uniformity in responses to pressures, to variety in responses. The outcomes of the pressure might differ due to seeking compromises, alternatives or negotiation.¹⁴²

According to Soares-Aguiar and Palma-dos-Reis (2008), the adoption of data exchange systems can be explained by the institutional theory due to mimetic, coercive and normative pressures.¹⁴³ Their findings also show, that, that e-procurement adoption can be explained by the institutional theory. This means, that external circumstances such adoption at competitors influence the decision of firms to implement e-procurement systems.¹⁴⁴ Implementation of e-tools can be the result of pressure, but it is not clear yet whether functional or institutional reasons differentiate in their successful outcomes. Generally, the implementation of operative procedures is not always based on a rational decision but rather institutional pressures which can potentially affect results.¹⁴⁵ Hartley, Sawaya, and Dobrzykowski (2022) researched the explanatory power of institutional theory for

¹³⁷ See Korsakienė, Diskienė, and Smaliukienė (2015; p.143)

¹³⁸ See DiMaggio and Powell (1983; p. 150)

¹³⁹ See Spina, Caniato, Luzzini, and Ronchi (2016; p. 23)

¹⁴⁰ See DiMaggio and Powell (1983; p. 150)

¹⁴¹ See Willmott (2015; p.109)

¹⁴² See Gauthier (2013; pp.86-87)

¹⁴³ See Soares-Aguiar and Palma-dos-Reis (2008; p. 123)

¹⁴⁴ See Soares-Aguiar and Palma-dos-Reis (2008; p. 129)

¹⁴⁵ See Kauppi (2013; p. 1331)

blockchain implementation in supply chains. Their results show, that regulations influence blockchain implementation, but also normative pressures play a role.¹⁴⁶

A common topic emerging in institutional research is sustainability. Firms experience increased pressure for implementing sustainability standards, also here as mentioned above the reactions differ.¹⁴⁷ Also, in the context of purchasing and supply management, different pressures force firms to implement practices, e.g. sustainability or digital tools – not always with positive results.¹⁴⁸ So far this theory has found limited use in buyer-supplier relationships and not been reviewed in the context of supplier satisfaction. Research by Spina et al. (2016) analysed a large database of supply management papers on their usage of grand theories. While overall there was a little usage of grand theories in supply management research, the institutional theory was one of the least mentioned.¹⁴⁹

Considering the lack of previous research with only a few papers hinting the relevance of institutional theory in supply management, this paper will examine whether a connection can be made between both concepts. While institutional theory can provide explanation in the field of supply chain management, its usage so far is low.¹⁵⁰ As Spina et al. (2016) state, suppliers might be pressured to implement digital solutions,¹⁵¹ which can be considered as a tool to achieve operative excellence. Viewing the implementation of process improvements from this perspective, it can be hypothesized that this pressure potentially has an effect on the buyer-supplier relationship. From the buyer's point of view, items with low uncertainty and risk may lead to lower isomorphism and vice versa for items with higher risk and uncertainty.¹⁵² Testing whether the institutional theory is suitable as an explanation for supplier's dissatisfaction with certain process improvements gives a different angle to this research's goals.

¹⁴⁶ See Hartley et al. (2022; p. 205)

¹⁴⁷ See Gauthier (2013; p. 89)

¹⁴⁸ See Spina et al. (2016; p. 23)

¹⁴⁹ See Spina et al. (2016; p. 26)

¹⁵⁰ See Kauppi (2013; p. 1331)

¹⁵¹ See Spina et al. (2016; p. 23)

¹⁵² See Kauppi (2013; p. 1333)

3. Introducing COMPANY X: Confidential

4. Methodology: A qualitative research approach

4.1 Conducting a qualitative case study with suppliers of COMPANY X

The object of conducting qualitative research is to contribute to improving scientific understanding of a certain phenomenon. It can be defined as: [...] “(1) how to do things – namely, generating and analyzing empirical material, in an iterative process in which one gets closer by making distinctions, and (2) the outcome –improved understanding novel to the scholarly community.”¹⁵³ The aim of a case study is to gain both practical and theoretical knowledge about the research field.¹⁵⁴ Conducting a case study is a tool to examine a phenomenon in depth in a certain context.¹⁵⁵

One advantage of case study research “is its ability to carry out in-depth study of a complex phenomenon.”¹⁵⁶ Since the purpose of this purpose is to gain practical information for COMPANY X, and also contribute to academic research, the case study research can be considered as an appropriate method. The field of purchasing is widely researched, however not the same counts for indirect purchasing especially connected to supplier satisfaction. Research in this field is limited, so conducting a case study helps to draw first conclusions on the topic as well as leave open questions for future research. The research units in case studies are normally not randomly chosen.¹⁵⁷ The interviews of this research will be collected from COMPANY X’ supplier base which can be considered purposive sampling. According to Andrade (2021): “A purposive sample is the one whose characteristics are defined for a purpose that is relevant to the study.”¹⁵⁸ Since the results should have relevance for COMPANY X, interviews with their suppliers will be conducted. The objective is to examine, how their suppliers perceive the importance of e-solutions and operative excellence on their satisfaction. The suppliers are all indirect suppliers delivering MRO articles, which are classified as strategic suppliers for COMPANY X. The purposive sampling method is a widely used sampling technique. It should be noted, that this approach increases the risk of bias and reduces generalisability of the study.¹⁵⁹ However, since the goal of this study is to produce a utilisable output for COMPANY X, this method and sample was chosen. Also from the academic perspective this can be justified. “The logic and power of purposeful

¹⁵³ See Aspers and Corte (2019; p. 155)

¹⁵⁴ See Ebneyamini and Sadeghi Moghadam (2018; p. 10)

¹⁵⁵ See Rashid, Rashid, Warraich, Sabir, and Waseem (2019; p. 1)

¹⁵⁶ See Bhatta (2018; p.78)

¹⁵⁷ See Ridder (2017; p. 282)

¹⁵⁸ See Andrade (2021; p.87)

¹⁵⁹ See Acharya, Prakash, Saxena, and Nigam (2013; p.332)

sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling. Studying information-rich cases yields insights and in-depth understanding rather than empirical generalizations.”¹⁶⁰ The field of indirect procurement, particularly in the context of supplier satisfaction is still understudied. Therefore, as explained above case-based research can generate new findings and provide input for further research topics. Since the variety of products and services is large in indirect procurement, the interview participants have been limited to MRO suppliers of COMPANY X. This increases the likelihood to draw reliable conclusions from the research.

As mentioned above, the sample selection of interview participants for this research can be described as purposive sampling. It refers to choosing participants based on their qualities which are likely to be relevant in the study and does not require a certain amount of participants.¹⁶¹ Typically, purposive sampling is used in the context of qualitative research. The downside of this sampling method is its subjective nature, which makes it difficult to be able to draw general conclusions from the research.¹⁶²

Poulis, Poulis, and Plakoyiannaki (2013) emphasizes the importance of considering context in the sample selection of case studies. Understanding the population and hence selecting appropriate samples is important while conducting case studies.¹⁶³

4.2 Conducting semi structured interviews and coding with Atlas.ti

Semi-structured interviews are a type of qualitative research. They give the interviewer more flexibility, as it allows to change and mix questions in the course of the interview. Other interview types exist, such as focused or narrative interviews.¹⁶⁴ According to Kallio, Pietilä, Johnson, and Kangasniemi (2016), the development of semi structured questionnaires involves the following stages: “1. Identifying the prerequisites for using semi-structured interviews; 2. Retrieving and using previous knowledge; 3. Formulating the preliminary

¹⁶⁰ Patton (2002; 273)

¹⁶¹ See Etikan, Musa, and Alkassim (2016; p.2)

¹⁶² See Etikan et al. (2016; p.4)

¹⁶³ See Poulis et al. (2013; p.312)

¹⁶⁴ See Hopf (2004; pp. 204-205)

semi-structured interview guide; 4. Pilot testing the interview guide; and 5. Presenting the complete semi-structured interview guide.”¹⁶⁵

Generally, competence on the research topic is required in order to ask the right questions. Even more important is correct training for the interviewer, to listen to the interviewee’s responses properly and avoid a dominating interview style which can be distracting and cause distress for the interviewee.¹⁶⁶

Characteristically, semi structured interviews are a mix of pre-defined questions and follow up questions. This allows to cover all relevant topics of the research, while at the same time leaving room for exploring certain topics more deeply.¹⁶⁷ Semi-structured interviews usually analyse and compare the responses item by item. Since a set of questions is defined and asked in the same order, the answers can be compared according to each subject. This differentiates semi structured interviews from unstructured or open interviews.¹⁶⁸ A semi-structured interview style can be considered appropriate for this research due to its explorative nature. Research questions have been defined in the beginning and interview questions are supposed to help answering these questions. However, the goal is to also gain new knowledge throughout the interviews and information which has not yet been covered by literature. Semi-structured interviews allows to get specific answers about a topic while at the same time following up on topics if they seem to be relevant.

There are different possibilities to conduct semi-structured interviews. Face-to-face interviews have the advantage of observing the interviewee’s non-verbal communication and can prevent misunderstandings. However, the interviewee might feel more pressured, particularly when being asked sensitive questions, which can lead to giving more socially accepted answers. Alternatively, interviews can be conducted via phone, which can be advantageous in terms of overcoming geographical barriers.¹⁶⁹

When designing the interview guide, it is important to consider the background of the people to be interviewed. The research subject should be broken down into understandable questions, in order to get the most out of the interviewee’s knowledge.¹⁷⁰

¹⁶⁵ See Kallio et al. (2016; p. 2961)

¹⁶⁶ See Hopf (2004; pp. 207-208)

¹⁶⁷ See Kallio et al. (2016; p. 2960)

¹⁶⁸ See McIntosh and Morse (2015; pp. 1-2)

¹⁶⁹ See McIntosh and Morse (2015; p. 7)

¹⁷⁰ See Herbert J. Rubin (2005; p. 7)

Supplier	Position of interviewee	Number
A	Key Account Manager	I1
B	Key Account Manager	I2
C	Key Account Manager	I3
D	Key Account Manager	I4
E	Managing director	I5
	Head of administrative processes	I6
	Head of Sales	I7
F	Sales Manager	I8
G	Key Account Manager	I9
	Sales specialist	I10
H	Key Account Manager	I11

Table 2: Interview participants

In order to allow for a proper analysis afterwards, the interviews were recorded if the interviewee consented. One participant wished to not be recorded, so notes were taken during the interview. With the help of a transcription software and manual checking, the interview data was brought into text. This interview transcript could then be used to analyse the data. For that, the main tool was Atlas.ti which supports the interview coding, since 10 interviews were recorded, a large amount of data had to be analysed.

To find patterns between the answers, an inductive coding approach was applied. Usually, coding is differentiated between two types, deductive and inductive coding. Deductive coding is the definition of codes prior to data collection, the codes are derived from literature findings. Opposed to that is inductive coding, which defines the code based on the collected data.¹⁷¹ Starting with the general research topic, next a broad definition of categories will be established. This will then be further specified using the collected material. After

¹⁷¹ See Fereday and Muir-Cochrane (2006; p. 91)

checking a significant amount of the data, the categories will be checked on their reliability and revised. This process is repeated once more, and the analysis can be derived.¹⁷² Inductive or interpretivist coding methods are particularly useful in new or underexplored fields of research.¹⁷³ For this research, the most applicable method is inductive coding. Applying an inductive approach afterwards allows to refine codes and explore new findings, which could not be found in literature before. Supplier satisfaction, indirect purchasing as well as e-procurement have been discussed widely in academia, however not altogether. The goal is to gain novel findings on how they interact with each other.

5. Research findings

5.1 Operational excellence antecedents differ between direct and indirect procurement

One of the objects of this thesis is to analyse operative excellence in the context of indirect purchasing. First of all, the relevance of operative excellence in indirect purchasing was analysed. Almost all interviewees mentioned the importance of the ordering process. This can describe multiple processes. One part of ordering process which was mentioned by many suppliers was the way the orders were sent to the suppliers. I5 mentions, that sometimes orders come by mail, which he finds unusual. Generally, digital orders are preferred (I11).

Timely payment was mentioned by most suppliers as important. I4 and I5 explain, that due to them being a small company larger outstanding payments can become an issue for them. As I8 explains, after 5 payment reminders the customer gets blocked and no new orders can be created. This can be undone manually but needs approval from management and can take a few days. Therefore, it is also risky for the customers if they do not pay one time as the consequences can be severe.

Demand forecasting was not specifically mentioned by the suppliers. After being asked about it in the interview, I3 explained that with the products they offer it is almost impossible to forecast, and he does not expect it from his customers, which was confirmed by I1. Instead, they internally have algorithms based on customer's order histories which help to anticipate demands. However, this is not necessarily customer specific and they do not expect to

¹⁷² See Mayring (2004; p. 268)

¹⁷³ See Eisenhardt (2020; p. 225)

receive forecasts from their customers (I1). I5 mentions, that once per year he discusses big projects which they expect in the course of the year. This helps them to plan their capacities in the upcoming year. However, he also mentions that a proper demand forecasting is not possible and he does not do that with any of his customers. The demands are not predictable.

RFQ related topics have been mentioned widely by the interviewees. More specifically, the missing feedback on RFQs has been mentioned by many suppliers (I1, I3, I5, I7, I8). As I7 explains: “and then we wait and we wait, and either the purchaser rings us up and then we talk about the price, then we wait again and then there is an order, or we keep waiting because unfortunately there is no response, and that is certainly an issue.” Furthermore, it would be useful if the customer already indicates in the RFQ which type of request it is, a real demand or to receive price information. Therefore, the suggestion is to add the RFQ process as an antecedent of operative excellence.

Regarding contact accessibility, I8 mentions that it is very important that you have a good contact with purchasing and also, if necessary, with the specialist departments. Usually the contact with the departments is more frequent than with purchasing, since their role is mostly limited to price negotiations. Technical questions are usually handled with the department itself (I11, I5, I7). I1 explains that it is very important for him to regularly see his customers in person. Despite digitalising more, real problems are best to be detected when he goes on-site to visit. This also help to generate new ideas to implement new processes. Something similar is stated by I11, who explains that despite many processes working automatically, he puts a great value on having good relationship with his customers. Especially like last years in crisis times, the human communication cannot be replaced by anything and is essential for fast problem solving. Quality of processes has been mentioned implicitly by most suppliers. As I9 explained, delayed or incorrect payments can be often explained by issues which happened earlier in the purchasing process. Also the lack of responses to RFQs can be often explained by a lack of process which lets the purchaser send a response automatically. (I6) Therefore, quality of processes can be considered as relevant, as it is a determinant of operative excellence factors.

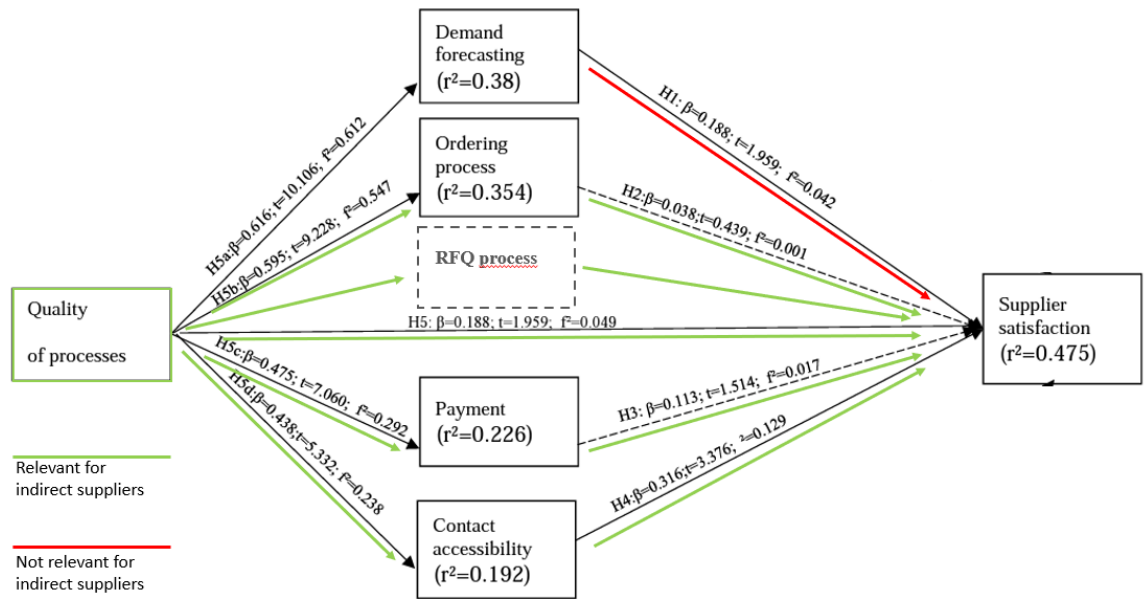


Figure 6: Adopted operative antecedents based on Ilkay (2019)

As can be seen in Figure 6, the red line shows antecedents which have not been shown to be relevant as opposed to the original model. Forecasting in indirect procurement seems to not be as important, as suppliers recognise the spontaneous nature of indirect purchases (I3, I10). Despite not expecting forecasts, I11 and I5 mention to appreciate a yearly review on turnover developments and future expectations of the purchasers. Antecedents which have shown to be relevant are ordering process, payment and contact accessibility. RFQ process was newly added, as this was mentioned as one of the most frequent topics by the suppliers.

5.2 Analysing the supplier's micro processes during the purchasing stages provides explanation for operative excellence perceptions

5.2.1 Planning supply – Forecasting and demand planning not part of regular indirect purchasing process

Due to the ad-hoc nature of indirect purchasing, activities in the planning stage are limited. Regular forecasts are not shared with suppliers and therefore it is difficult estimate in advance how the business will develop.

No interviewee mentioned forecasting by themselves, only after being asked. I3, I5 and I1 explain that they do not expect their customers to share forecasts, because of the nature of

the products. I3 explained that he thinks its impossible to forecast the products their customers buy. I1 further explained that they have algorithms internally which help them to replenish their stock. Instead of relying on their customers, they have their own stock management system. Furthermore annual reviews take place with their customers to get an overview on upcoming projects. While there is no guarantee to receive actual orders, it helps the supplier to estimate how many capacities he should reserve for each customer. (I5, I3)

5.2.2. Selecting supplier – Feedback on offers is usually missing

Most suppliers described that the interaction with the customer starts with an inquiry (I1, I3, I5, I7, I8, I10). The ways that these inquiries reach them are various. The case company recently had implemented a so-called free-text request tool. This is a standardised way to send RFQs about non-standard articles. However, customers still send mails, and even call the sales department about the availability of products (I1, I3, I8). This is similar for all customers, suppliers stated that they use many different channels for receiving their customers' request (I3, I1).

Once the product request arrived, the suppliers look in their system and database to find more details about the product. What is important to note, is that most requests do not come from the purchasing department directly, but from the internal customer themselves. As I1 stated, it happens rather frequently that customers send 'free text' requests for standard articles which can be ordered through e-catalogues. In that case, I1 mentions, that they do not process the RFQ, but rather respond to the customer to order the article themselves from the catalogue. The e-catalogues are maintained in certain intervals (e.g. every 3-6 months) and besides that do not require any more manual input from the supplier. Although, as I3 mentions, that maintaining their customer's catalogue on the Mercateo platform requires more manual input than their in-house solution.

“There's a very, very big difference, because we're still doing most of the Mercateo maintenance manually, and since you don't work on it every day, of course, I have to take a closer look. Okay, how did that work? Where do I have to do what? How is what set? Of course, you are a little more familiar with your own systems and can follow everything a little more easily.”

While they are willing to serve their large customer's wishes and use their preferred platforms, smaller customers have to use the standard solutions. Not all suppliers offer e-catalogues, so this topic arose from suppliers who provide many standardised products.

When the article turns out to be non-standard, then the internal sales department proceeds to gather all necessary information to create an offer. According to I3, depending on the product and complexity this requires searching of the customer's order histories, using their own supplier database or even performing internet research. Afterwards, the offer is sent to the customer. As I1 states, it is helpful for him if the customer states in his request whether the offer is urgent or not. Due to limited capacities, this would help them to prioritise their work. Another point which I3 stated, the offer validity time decreased over the last years. While a few years ago, he was able to submit offers with a validity date of weeks or even months, this is not possible anymore currently as the prices of his own suppliers are constantly changing either.

In the second stage of the procurement process, the offer is at the customer for supplier selection. During that time, the supplier waits for feedback. Here, many interviewed suppliers reported similar issues. Most of their customers do not send feedback to the offer. Suppliers reported that they keep track on statistics on how many offers turn into orders. I5 wishes, that his customers would proactively give feedback as, “[...] *we really have to demand this information.*” Often, he receives calls to negotiate the prices. But after that, either the purchaser sends out an order or there will not be any other feedback. It would be helpful to just receive a short information if the order is coming or not. This helps our capacity planning and would help a lot. Further he mentions, that he started to invite the customer to a monthly regular meeting, in order to follow up on open projects, as he would not receive this information otherwise (I7).

I3 also stated that he never receives this information either. If the offer value exceeds a certain amount, then he would follow up with the customer. But generally, it is not worth the effort. “*It usually doesn't pay off. The margins are not high enough.*” I1 mentions a similar things, saying that below a certain value they do not follow up on offers.

Furthermore, I1 explains, that they can retrieve extensive statistics about their customer's order behavior from their system. Order probability is an important one. However, he also explains that it would be helpful if the reason for the request came already with the order. If they knew, that the request is simply to get a price information, they could treat it differently

in their statistics. Besides that, they can understand what to improve in the future, if they receive feedback on their offers. “[...] *the mass of small inquiries that do not result in an order, yes, did you only need this as price information? Was there no demand behind it now, or did we lose it because we were now off by amount X? Those are things that we would like to know, so that we can deal with it better next time.*”

I3 explains, that usually the processes are closed in the system after a certain time of no reaction. While it is no problem to reopen the process again, usually the offer conditions have to be adapted, which the customer generally does not realise.

5.2.3 Contracting – Customers do not always stick to framework agreements

Most suppliers did not mention contracting in the context of operative excellence. However, I9, mentioned that customers do not stick to the agreements of the frame contract. This leads to additional unnecessary work. “[...] *we have a paragraph in the contract that is allowed to renegotiate from a sum x, [...] Your house still tends to call again when it's below [sum X] and [Purchaser] calls the respective seller, and asks what can we do here about the price? Then I really wonder why we have an agreement.*”

He says that it also decreases transparency a lot. “*I believe that [...] this manual intervention in these processes, that it confuses a lot, because how is the back office supposed to know what the salesperson has exceptionally agreed again.*” Since the back office is responsible for creating the offers and handling orders, any agreements which are not set up in the system usually cause more manual work as they have to be double checked at all times.

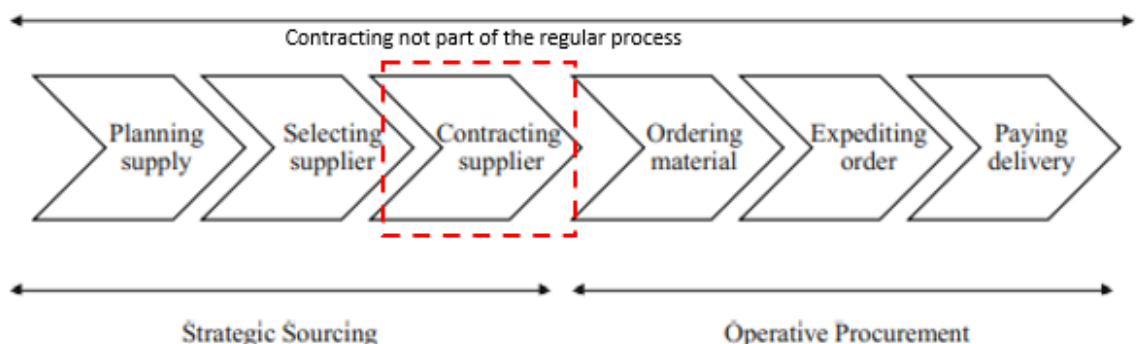


Figure 7: Contracting not part of the regular indirect purchasing process Schiele (2019)

5.2.4. Ordering material – Often a large time period between offer and final order

When the customer decides to send a purchase order, it first has to determine whether the related offer is still valid. As previously mentioned, I3 stated that offer validity times decreased a lot over the past years. I10 also mentions, that often data in the order does not match the offer. One reason can be, that the offer was not valid anymore. Other reasons can be simply mistakes on customer side, or others which are unknown to the supplier. Generally, an order confirmation is sent regardless, usually indicating the correct terms as supplier 10 explains. They do not insist on the customer correcting the order. However, the customers often do not recognize these changes, which then lead to issues with the invoicing, which will be elaborated later on.

The orders arrive via different channels, sometimes per EDI, via email as a pdf, even physically via mail (I1, I3, I5, I10). I5 supposes, that the reason for receiving orders physically is when the order exceeds a certain value. EDI was known to most suppliers, but not commonly used. Besides from automated solutions such as e-catalogues, most orders still arrive via e-mail. One supplier even mentions that sometimes orders physically arrive via mail. *“There are situations where the order [...] comes by post, that surprises me.” (I5).* The suppliers mention, that many different channels exist, between their customers but also for the same customer different solutions are used. I4 also states, that orders usually come per mail

I3 mentions, that their system is not fully compatible with all of their customer's systems. Their customer had implemented a tool to send freetext requests (not bound to a part number code/standard article) via BeNeering instead of sending e-mails. While on the customer side this allows for more automation in the RFQ and ordering process, this is not the same for the supplier. *“[...] what is a bit annoying at that point that it runs as a separate process, not yet related to the offer process. Accordingly, we always have two processes in the system for orders from free text requests, one with an offer and one with the order.”* However, he also mentions that the additional workload is bearable for them and for their large customers they are willing to make these compromises. A similar thing is reported by I11. To their regular customers they offer an in-house solution web-shop which basically works like any other marketplace and customers can order from there. For large customers and strategic partners they are willing to discuss the implementation of customer wishes and using more tailored

solutions. I4 explains, that new implementations cost them a lot of resources as they do it for multiple customers.

5.2.5. Expediting order – Manual process but usually without major issues

As soon as all order conditions are checked and approved by the internal sales department, the order is set up in their system, an order confirmation is created and in most cases sent to the customer. As it has been explained in the previous chapter, sometimes the order confirmation entails crucial information about changes, which are not always acknowledged by the customer (I10). Many orders are still set up manually, however this is changing and depends on the technology used by their customer. I3 had explained, that his customer's procurement tool does not allow for the orders to be set up in the system automatically. I1 reports, that if all conditions match the offer, then often it is possible that the order is automatically placed into their system.

Since all interviewed suppliers are from the same country as case company, order expediting is usually a short and uncomplicated process. It typically refers to double checking the customer order. No supplier mentioned issue with following up or keeping deliveries.

5.2.6. Paying delivery – Different reasons for late payments

The last step in the purchasing process is usually handled between both accounting departments. Different ways for order payments exist. A very common one is that the payments gets triggered automatically when the goods arrive in the customer's warehouse and the supplier does not have to send an invoice anymore (I1, I3, I11, I8). Most suppliers mentioned this process as practical, but also explained downsides. According to I10, problems can occur when both parties do not work parallel as he describes it. The problem with the payment usually has its root already in the order. For different reasons, the offer and order price do not match sometimes. In those cases, I10 notifies his customer in the order conformation, that the price has to be adapted.

“The order confirmation is automatically communicated back to the customer. We have received an order. Thank you, but [the price] is not correct. Please adjust the order or confirm. And yes [...] as said, either ignored or not responded. I mean, of course we don't want to wait that long with deliveries either. Because the customers usually want to receive

their goods as quickly as possible, we send it out with a clear conscience, that this can then somehow be clarified afterwards and then the goods go out, despite the fact that the order has not yet been adjusted.”

I10 explains this as the most common reason why payments are delayed or not correctly fulfilled. According to I1 and I3, depending on the customer and their warehouse organisation, sometimes the goods are not marked as received. Then, the delivery does not get paid. Internally, this information comes from their accounting department. “[...] every few months, a small list comes together, which we then send afterwards [to the customer], and then say it was delivered. Of course, we make sure beforehand that there really is proof of delivery or something similar, that it really reached them.” He then sends this list to the corresponding purchasing department. How fast this gets solved depends on the customer. Furthermore, I5 states that the timely payment is very customer dependent. He says however, that he knows his customers and does not have to collect statistics on their payment behaviour. However, he also states that extreme cases where customers do not pay are rare. Considering the whole volume and all the processed transactions, it is not so much. I9 describes that internally they discuss these issues as they come. Usually, payment reminders are sent to customers from the accounting department.

At some point, the customer account gets blocked. His colleagues escalate this issue to him, and he can ask to authorize unblocking of the account (I1). I1 also reports, that on the first levels, the colleagues try to deal with the customer themselves, and he gets involved as an escalation point.

5.2.7 Summary: The most common issues are responses of offers, usage of too many different systems and not following processes

Planning supply	Annual review meetings with customer to discuss business and next fiscal year planning	I5, I3
	Supplier makes their own forecast through algorithms	I1
	Forecasts are not shared with supplier	I1, I5, I3
Selecting supplier	Requests arrive through many different channels (e.g. call, mail, e-procurement tools)	I1, I2, I3, I4, I5, I8, I10

	For standard articles catalogues are used	I1, I2, I3, I4, I8
	Customer does not follow agreed processes	I1, I3, I9
	Maintenance and usage of customer's system requires additional effort	I3, I8
	Offer creation through own database, customer's order history, internet research	I3
	Additional information in the RFQ regarding priority would be helpful	I6, I1
	No feedback on offer from customer, unless an order is sent	I1, I3, I5, I7, I8
	No follow up on offer up to a certain threshold	I1, I3
	Collecting statistics on their customers	I1, I2, I11, I5, I7, I10
Contracting	Frame contracts are used and negotiated	I11, I9
	Customer does not stick to conditions agreed in the contract	I9
Ordering	Offer conditions do not match order sent by customer	I3, I9, I10
	Order are sent through many different ways (e-mail, EDI, post, e-procurement tools)	I1, I3, I4, I5, I10
	Customer's systems require manual efforts	I3, I4, I8
	Larger suppliers offer their own in-house ordering solution, usually like a webshop	I1, I2, I3, I8, I9, I10
Expediting order	Orders are checked and an order confirmation sent	I1, I9, I3, I4
	Even if conditions in the order are not correct, to ensure fast delivery, the order is accepted anyway	I9, I8
Paying delivery	Suppliers use an automatic credit system, as soon as the delivery is booked at the customer, the payment gets triggered and no invoice has to be sent	I1, I2, I3, I11, I8, I9
	Not booked deliveries lead to open payments, which are detected by suppliers accounting department	I3, I1, I9
	If customer did not adapt the order price when order confirmations are sent, deviations in payment can occur	I9

	Some customers pay late on purpose	I1, I4, I5, I6, I10
	Supplier's accounting department uses or plans to use an automatic payment reminder system	I1, I3, I5, I6, I10
	Delayed payments are dangerous for our company	I5, I6
	Customer account gets blocked if payments are not on-time	I1, I2, I8,

Table 3: Summary of interviews

After summarizing the results on the interview process and related problems, certain topics were mentioned by most suppliers. Starting with the request from the customer, suppliers (I1, I2, I3, I5, I8, I10) mentioned that they receive the RFQs via multiple platforms. This varies within the same customer, but also between customers. E-mail and phone are still popular channels, but the usage of e-procurement tools is increasing. As I5 explains, usually the requests come from the department itself and not from purchasing. Many suppliers offer catalogue ordering for standard articles. These can be in-house solutions, or the suppliers feed the customer's catalogue with articles (I1, I2, I3, I8, I9). I3 explains, that working with his customer's solutions requires more effort. He is only willing to put this effort for larger customers. Others should use the company's in-house solutions (I1, I3, I8).

After the offer sent out, the supplier is waiting for feedback from the customer. The most common issue which was mentioned here by multiple suppliers, that feedback on offers is always missing. Either the customer will send an order, but negative feedback is never given (I1, I3, I5, I7, I8). I1 mentions, it would be helpful to already get information in the request, whether it is an actual need, or just a price request. This would help to categorize customer requests better and statistics which are collected internally would be more exact. I1, I3, I5, I7, I8, I10 all mention to collect data on the customer's order behavior/order probability.

Another issue which happens, that customers do not stick to the conditions in the order, or order after the validity date of the offer. As I3 explains, then he has to repeat the process of the offer creation, request conditions from his supplier and eventually create a new offer. Another issue, which was only mentioned by I9, is that customer's do not agree to contractually agreed conditions. Frame contracts usually determine a value from when offers can be negotiated. It happens regularly, that customers try to negotiate products below that value. This disturbs the processes at the supplier, because if special agreements have been

made between the Key Account Manager and customer, the Sales responsible who is processing the order does not know about this.

Lastly, payment was mentioned by almost all supplier's to be an issue. Generally, delayed payments are managed by their accounting department, as most suppliers use an automatic payment reminder system, those suppliers who do not use implemented it yet, plan to do it in the future (I1, I3, I5, I6, I8, I10). Usually, if the payment issue is not resolved after a few reminders, it gets escalated to the Key Account Manager. Another issue, which I10 describes in more detail, that the cause can be found already in the order. If the customer does not use the correct price in the order (which can have multiple reasons) and a credit system is used (payment directly after delivery is registered), then the wrong amount gets paid. Until this is resolved, and the supplier receives the correct amount, it usually takes a long time. Another issue which can happen with the credit system, is that orders are not registered as delivered and therefore payment does not get triggered. I3 describes, that every few months he receives a list of open payments from his accounting department and then discusses it with the customer. Delayed payments are described by I5 as harmful for the business, because they are a small company and outstanding payments are a danger for their cash flow. Further, suppliers also describe that there are always customers who extend the payment date on purpose. In those cases, I5 explains, to sometimes insist on advance payments.

Summarising, the most mentioned issues during the indirect purchasing process are:

1. Lack of responses to offers in the RFQ process (I1, I3, I5, I6, I7, I8)
2. Too many manual processes and risk of mistakes (I2, I3, I9, I10)
3. Lack of support and alignment in implementing tools (I3, I6, I8, I11)
4. Delays in payment or payment differences (I1, I2, I3, I4, I5, I7, I8, I9, I10)

5.3 Satisfaction with e-tool implementation depends on the size of buying and supplying firm

I2 explains, that they are open to introduce their customer to e-procurement solutions and it is actually part of their business model *"It's also important to us that we really give advice on the various options that are available."* Further he states that *"[...] we always explicitly look for solutions for the customer."* I2 explains, that the opportunities for e-procurement solutions mostly depend on the customer's resources and willingness. According to him, sometimes purchasers focus too much on saving on the product itself instead of the saving potential in the process.

“However, it can also be the case that they say, yes, we would really like to do that, but we have a problem, we don't have SAP or we simply don't have the software or platform for it. I also have this [topic] with a current customer, and he says, okay, but we'll introduce SAP next year, and then we'll meet again in a year and a half. Then we'll see to what extent we can introduce some of these solutions. Because in principle it's a win-win situation. Not only a huge saving in terms of time and money, for the customer, but it is also for us, for those who work in order processing. [...] The manual process that has to be tackled is significantly lower.”

I3 mentions, that they usually follow their customer's processes. He explains, that recently COMPANY X introduced a new RFQ and ordering process with a tool which is supposed to replace e-mail requests. However, he explains that this tool is not totally compatible with their system and adds an additional process to their system. Related to that, I8 explains that as COMPANY X is their largest customer, they are open to implement new technologies. However, they do not really have the knowledge and depend on COMPANY X to guide them in the implementation. With smaller customers they usually stick to the known processes. *“Yes, I remember last time when we implemented this new RFQ tool. We had a sort of presentation from [COMPANY X] them and then it just got implemented. It is not difficult to use, and [...] is a very good contact in your purchasing department so we contact him. But to be honest, yes, there is not much benefit for us and just another tool to use. But the benefits for COMPANY X are clear so of course we support them.”* (I8)

Something similar is reported by I4, who is confronted with new customer wishes: *“Yes, this is a difficult topic [...]. One of our customers just came to us recently that from next year I think, they want us to use a tool for order follow up and tracking. I have not dived into the topic that deeply yet. But our IT department said they don't really know how to connect it with our system. So at least in the beginning we have to feed it manually. I know why this is so helpful for our customer, but it really strains our capacities. You also have to understand, our IT department consists of a few people. We do this for our big customers and anyway we don't have a choice. But these topics are a pain for me honestly speaking.”* (I4)

I1 explains, that e-catalogues are still the most commonly used e-procurement tool and relatively easy to implement, is however limited to standard articles. Furthermore, he explains, that he has many smaller customers whose digitalisation is still limited to sending requests via e-mail. He is advertising the usage of their online shop to customers, but also

recognises that for the customer's it is sometimes easier to send a request via e-mail than searching through the large catalogues. Regarding e-catalogues, I3 explains that for their large customers his company is willing to use the platform which is wished by the customer. However, smaller customers have to use the supplier's webshop.

Small supplier + large customer	→ Implement customer's processes and tools
Small supplier + small customer	→ Usage of known processes (phone, mails)
Large supplier + small customer	→ Customer uses supplier's standardized solution
Large supplier + large customer	→ Aligned new process implementation

Figure 8: E-procurement adoption willingness depending on firms' size

As I1 explains, generally they internally distinguish between two types of demands. The ones which are standardised and there are solutions such as e-catalogues, tool vending machines which automatically refill. And then there are still a lot of manual requests, which perhaps cannot be automated, but have a lot of potential to be more digitalised.

“Nowadays it is really not necessary to call our sales department to receive an offer. But yes, that is reality. Many departments and purchasers are totally overworked. So they do what they know, they don't have time to implement any tools. If they need something, it has to be fast.” (I1).

I10 also explains, that most customer's requests come through a normal ticket system, where each price request but also order is handled. This is the standard process. He states though, that often this is unnecessary work, as they have standard articles and previous agreed prices. With large customers, where rigid frame agreements exist, usually the offer step is skipped and the articles can be ordered through a customised digital catalogue. Similar to other suppliers, I9 and I10 continuously look for new solutions to improve processes with large customers and usually those customers come to up to them with their own wishes on which digital processes to implement. I9 explains that the average German 'Mittelstand' does not have the resources and systems to implement digital systems, so usually they use solutions offered by the customer.

When looking at integrating e-procurement into the supplier satisfaction framework, it does not appear that e-procurement is a direct antecedent of supplier satisfaction or a factor of operative excellence. Based on the interviewee's statements, it rather seems that e-procurement can be a lever to improve the different operative excellence factors. As I7

stated, it would be helpful for them if there was a better process dealing with the RFQ phase, where the status can be followed up, and in case of a negative response they would receive a short message or any type of feedback. Furthermore, I1, I2 and I9 explain that digital tools reduce the risk of mistakes and improve the overall ordering process. Additionally, I1 and I2 mention that he is very passionate to discuss e-procurement topics with his customers and thinks that common projects have potential to strengthen the relationship between both parties. Downsides also have to be mentioned. If the tools are not maintained, then mistakes usually only get detected at the final stage, the payment which sometimes leads to the supplier waiting for payments a long time (I9). Nonetheless, it can be concluded from the results that if e-procurement systems are used in the proper way, they can have a positive effect on operative excellence factors. E-procurement can be seen as an indirect facilitator to increase supplier satisfaction. The findings show that it is a tool to improve process quality along the entire purchasing process.

6. Developing a maturity model for indirect purchasing

Based on the maturity model of Schiele (2007) a maturity model can be derived also in the indirect purchasing context. It is structured based on the stages of the purchasing process by Schiele (2019):

1. Planning supply, 2. Supplier selection, 3. Contracting as strategic activities and
4. Ordering material, 5. Order expediting and 6. Payment as operative activities

Each stage of the purchasing process is divided into sub-categories. Each category has assigned questions, helping to assess the score in said category. Points from 1-20 are given, separating four maturity stages (Appendix 1)

The categories are designed based on the results of the literature review and the interviews. The interviews were conducted with suppliers, therefore criteria for purchasing maturity were derived from their input. In order to provide a more comprehensive model, other criteria were added based on the literature found.

Planning supply

Purchasing planning focuses on purchasing relevant topics such as measurement of cost savings and cost evolution. Indirect purchasing materials can sometimes be difficult to track, due to their ad-hoc nature and lack of registered part number.¹⁷⁴ Optimally, organisations find a way to create transparency and traceability, as this is a large risk in indirect procurement.¹⁷⁵ Furthermore, having suppliers clustered and assigned to commodities can be useful. Especially in indirect purchasing, where spend categories vary from office supplies to consulting services, it can help to gain a clear understanding of the spend. At a high level, every supplier is assigned to a specific commodity for which a commodity strategy and qualified purchaser exist. The next topic is the internal alignment of purchasing and other departments. Due to the large variety of internal customers, there is a risk that information gets lost and communication is not effective. At a low maturity level, there is no cross functional collaboration for development of a supplier strategy, or such a strategy is not even existing.¹⁷⁶ The opposite, a high maturity level shows a high degree of alignment between internal stakeholders and purchasing. Budget planning and strategy formulation are executed cross-functionally.

Another aspect of planning supply is forecasting and demand planning. Due a large extent of ad-hoc purchases results have shown that demand forecasts are difficult to implement.¹⁷⁷ Therefore, a low degree of maturity means that the purchasing department does not share any forecasts with their suppliers and also lacks the tools to develop such forecasts. With a high maturity, artificial intelligence and algorithms develop forecasts which are shared with suppliers.

Selecting supplier:

The next category is supplier selection with the sub-categories supply base definition and tendering. This category focuses on analysing the supplier selection guidelines and standard a company has implemented. The question is if there is a strategic supply base management with preferred suppliers to choose from and suppliers are selected based on standard criteria.

¹⁷⁴ See Kwon et al. (2009; p. 108)

¹⁷⁵ See Glas and Kleemann (2016; p. 224)

¹⁷⁶ See Van Poucke et al. (2014; p. 1)

¹⁷⁷ See Kwon et al. (2009; p. 108)

Unmature purchasing organisations do not have a preferred supplier pool and do not maintain strategic relationships with suppliers. Furthermore, they do not follow any standardized processes in the supplier selection process, while price may be an indicator a lot of the decision depends on individual preferences. As discussed in the literature review, indirect procurement as opposed to direct procurement cannot be considered a strategic function.¹⁷⁸

Tendering activities refer to the processes which have to be followed to send out requests to suppliers and collect offers. In indirect purchasing it is common, that the internal requester sends out the request to the suppliers directly without any purchasing involvement as the interviews have shown. This can increase the risk of Maverick buying, meaning that individuals within the organisation procure materials or services without involvement of the purchasing department.¹⁷⁹ While this results in a lack of transparency, digital RFQ tools can be implemented which allow the process to be steered by purchasing, but do not require involvement in every operative activity. This can reduce Maverick buying.¹⁸⁰ Another point is the offer feedback, which has been added to the model as it has been mentioned quite often in the interviews, but not in literature. Low mature purchasing organisations do not provide their suppliers any feedback for their offers, while in high maturity organisations this process is entirely digitised. The purchaser or internal requester can send the offer feedback through the same tool as the supplier send the offer.

The last category of supplier selection is the role of purchasing. This is divided into purchasing involvement and negotiation. High maturity means that purchasing is fully responsible for the supplier selection process in alignment with the relevant departments. All negotiations are managed by purchasing and there are clear guidelines which need to be followed.

Contracting supplier

Contracting supplier is the third step in the purchasing process according to Schiele (2019). It starts with frame contracts, at the lowest level it is not standard practice for an organization

¹⁷⁸ See Rafati and Poels (2017; p. 280)

¹⁷⁹ See Katri Karjalainen, Kemppainen, and Van Raaij (2009a; p. 245)

¹⁸⁰ See de Boer et al. (2003; p. 32)

to close frame contracts with their suppliers. Frame contracts have been considered important in indirect purchasing, as they can decrease Maverick buying.¹⁸¹

Document storage is another topic, a high score means that there is a centralised digital storage solution. This can be accessed by all authorized members of the organization and is uploaded automatically once the documents gets signed electronically.¹⁸²

Another point is the usage of AI for contract management, at the lowest level no AI is used and contracts are updated irregularly. A high score means that contract templates are continuously updated through AI, and always up to date to legal requirements.¹⁸³

Ordering material

The first point for ordering is the approval workflow preceding the order, normally called purchase requisition or order requisition. It ensures approval of the budget responsible and serves as a four eye principle. At a low level, purchase requisitions are not required and if approvals are collected this happens through mails or informal communication. This point was added to the model as it is also connected to Maverick buying.

The next category in ordering material is the degree of digitisation and automation of the ordering process. As indirect procurement includes a lot of different commodities, automation possibilities vary a lot. For standard articles an e-catalogue or e-marketplace can be implemented. At a high level, a purchasing organisation has one marketplace where articles from different suppliers are offered, so the requestor has all available products at one place. High volume articles can also be offered through automated replenishment tools, such as tool vending machines. The interview results showed that suppliers see more potential in these tools to increase automation.

The last category is the connection between buyer's and supplier's ERP systems. If orders have to be entered manually at the supplier's, it indicates a lot level of harmonisation between both companies and low maturity. A supplier mentioned that due to implementation of a new tool, his manual work slightly increased as there is no direct connection with their ERP

¹⁸¹ See Rothkopf and Pibernik (2016; p. 88)

¹⁸² See Appiah and Lartey (2019; p. 22); See Katri Karjalainen et al. (2009a; p. 257)

¹⁸³ See Allal-Chérif et al. (2021; p. 70)

system. Seyedghorban et al. (2020) also highlight the importance of harmonised digital processes and the potential arising from them to increase visibility and connectivity.¹⁸⁴

Expediting order

After order placement, the order status needs to be followed. Due to a large variety of stakeholders, following up on purchase orders in indirect procurement can be a time consuming task. Therefore, a high maturity purchasing organisation has continuous data exchange with the supplier, allowing the tracking of the order status by the requester directly. Involvement of purchasing is not necessary anymore in this case.¹⁸⁵

The final step is the notice of shipment and arrival. As suppliers mentioned during the interviews, sometimes goods are not marked as received or it is even unclear whether they arrived. Furthermore, parts can get lost upon arrival due to missing labelling. This can result in two issues, firstly the requestor not receiving his products and the supplier not getting paid as highlighted by interview participants.

Paying delivery

A high level of maturity regarding invoicing means that they are processed fully digitally and automatically for a large extent. The invoice processing system allows matching of purchase orders and invoices. Manual checking is only needed in case of incorrect information in either the invoice or the purchase order.¹⁸⁶

Furthermore, a high degree of maturity is the strategic usage of payment terms. The payment due date should be aligned with the company's financial situation and options like cash discounts used. This requires appropriate infrastructure in invoice processing, as it needs to be ensured that such invoices are processed with prioritisation. Suppliers mentioned the issue of late payments during the interviews.

Lastly, it needs to be ensured that payment of invoices is according to the organisation's process standards and authority guidelines. Lack of guidelines and paying of invoices

¹⁸⁴ See Seyedghorban et al. (2020; p. 1691)

¹⁸⁵ See Waithaka and Kimani (2021; p. 33)

¹⁸⁶ See Cuylen et al. (2016; p. 125)

without matching purchase orders indicates a low maturity level. Invoices without orders are generally refused and blocked by the system at a higher maturity level. This issue is also identified in academic research in the context of Maverick buying, which can result in issues for all procurement stages and in particular invoicing.¹⁸⁷

¹⁸⁷ See Graven (pp. 52-53)

7. Discussion

7.1 Differentiating between direct and indirect purchasing in supplier satisfaction research is necessary

During the course of this research it became evident once again, that a large extent of PSM research and theories are designed and tested in the direct purchasing field. Theories such as the preferred customer concept or purchasing process models can benefit from extending research in the indirect procurement field.

Comparing supplier satisfaction research of Vos et al. (2016) and more recently Ilkay (2019) with the results of this study, it appears that motivations of indirect suppliers are inherently different. Looking at the first research question, *which factors of operative excellence can increase supplier satisfaction?*, operative excellence factors in indirect purchasing differ. The similarities which could be found in operative excellence antecedents were contact accessibility and quality of processes, both important in direct¹⁸⁸ and as shown in this paper, indirect purchasing. Opposed to that, due to its ad-hoc nature, indirect suppliers do not put much value on receiving accurate forecasts from their suppliers. This goes in line with Kwon et al. (2009), who state that most indirect purchases are based on spot buying and therefore forecasting is difficult.¹⁸⁹ Processes, however, are very important for suppliers and smooth operations can potentially increase their satisfaction. Furthermore, payment has also shown to be a relevant factor in indirect procurement and suppliers stated that late or false payments from customers can have a large impact on their operations. This was especially mentioned by smaller companies, who are dependent on timely payments. Additionally, the suppliers in this research mentioned that late payments cause a lot of additional work in their accounting department and can even lead to customer accounts being blocked. A new factor which was mentioned a lot during the interviews, was the RFQ process.

This leads to answering the second research questions, which analysed operative excellence factors on a deeper level by answering why operative excellence can increase supplier satisfaction in indirect procurement. The most mentioned topic during the interviews was the dissatisfaction of the suppliers during the RFQ process. More specifically, the lack of feedback on their offers. Interestingly, this topic has not appeared in literature, as so far the

¹⁸⁸ See Ilkay (2019; p. 44)

¹⁸⁹ See Kwon et al. (2009; p. 108)

ordering and payment process have been in focus.¹⁹⁰ Literature focuses on RFQ related topics such as improving time until offer, pricing¹⁹¹ or supplier screening.¹⁹² One could argue that the difference in results cannot just be explained due to the differing purchasing situation. As mentioned by Ilkay (2019), the industry in which buying and supplying firm operate might also play a large role. His research was conducted in the defence industry, and results might differ to other industries such as automotive.¹⁹³

Nonetheless, it is indicated that indirect procurement significantly differs from direct procurement and this fact is so far not considered in literature. Many findings and generalisations which are made in PSM research do not always clarify that the research has been conducted with direct suppliers and results are potentially not applicable to indirect procurement. While researchers often indicate in which industry they have conducted their research, the type of spend which was analysed is not always clearly stated. As the study shown, indirect purchasing shows many particularities and therefore separate research is necessary.

Another particularity of indirect purchasing also shows in purchasing process models, which are more applicable for the direct purchasing situation. Different purchasing process models generally distinct between strategic and operative purchasing activities, one of the steps being contracting.¹⁹⁴ As shown in this study, contracting between buyer and supplier in indirect procurement usually happens once, while all other steps are executed every time a product is ordered. Therefore, despite requiring only a small modification, these process models are not fully applicable in indirect procurement.

7.2. Satisfaction with e-procurement implementation depends on the nature of relationship between buyer and supplier

7.2.1 Variety of responses on the satisfaction of e-procurement solutions

Another aspect of this research was to investigate the mechanisms of e-procurement as a factor of operative excellence. The research question was: *To what extent can the*

¹⁹⁰ See Ilkay (2019; p. 44)

¹⁹¹ See Leung, Luk, Choy, Lam, and Lee (2019; p. 17)

¹⁹² See Wan and Beil (2009; p. 935)

¹⁹³ See Ilkay (2019; p. 45)

¹⁹⁴ See Bäckstrand et al. (2019; p.5); See Schiele (2019; p.48)

implementation of e-procurement tools be a facilitator to achieve operative excellence in indirect procurement?

The results showed, that e-procurement can be a tool to achieve increased operative excellence. However, it also became evident that, it cannot be clearly determined whether e-procurement implementation can improve supplier satisfaction, as the responses were mixed. The results indicate that this is influenced largely by resources of the supplier and perceived benefit, the latter meaning mostly depending on the turnover the customer makes. Suppliers who did not have a lot of experience with e-procurement adoption stated that they need their customer's support. Others, who have been very involved in digitalisation mention it as a great possibility to eliminate mistakes coming from manual processes. Some suppliers shared a high motivation to work on digitisation topics and also proactively offer these solutions to their customers. This goes in line with the findings of the literature review, as Min and Galle (2003) state that e-procurement adoption depends on the suppliers available resource, and if resources are not sufficient, support by their customers.¹⁹⁵ Available resources play a large role in the willingness to implement e-procurement, and larger firms are more likely to implement such systems.¹⁹⁶ Therefore, it is crucial to consider the situation when buying and supplying firm differentiate a lot in size and resources and as the results show, perceived benefits of e-procurement adoption differ between both parties.

7.2.2 The institutional theory can explain why certain suppliers are dissatisfied with process changes

In the literature review, the institutional theory was introduced, which was supposed to be examined whether it could serve as an explanatory theory for e-procurement adoption and other process improvements. The theory indicates that implementation of e-procurement tools can be explained by external pressures. Firms might see it as a safe way and imitate actions of their competitors¹⁹⁷ or are forced by pressures to implement them.¹⁹⁸ In the context of this research this refers specifically to the suppliers being pressured to implement new processes because their customer (COMPANY X) is demanding it. If a supplier is highly dependent on COMPANY X it can be hypothesized, that their openness towards new processes stems from not having another choice rather than internal motivation.

¹⁹⁵ See Min and Galle (2003; p. 232)

¹⁹⁶ See Smadi and Ababneh (2018; p. 9)

¹⁹⁷ See Soares-Aguiar and Palma-dos-Reis (2008; p. 129)

¹⁹⁸ See Spina et al. (2016; p. 23)

Looking at the empirical findings, it appears, that the theory can at least partially explain e-procurement adoption of suppliers. The results showed that some suppliers implement certain systems, despite having a benefit. In some cases suppliers even reported to experience more work since the system implementation. Generally, smaller suppliers with less resources indicated that one main reason for implementation is usually the lack of choice. While suppliers were hesitant to clearly express their dissatisfaction with these systems, they stated that the implementation is customer driven and for them means more work with unclear benefits.

E-procurement can be a facilitator for operative excellence factors instead of influencing supplier satisfaction directly. If the implemented e-procurement solution negatively affects the supplier's operative excellence then e-procurement can indirectly decrease supplier satisfaction and vice versa. Generally, it is a challenge to satisfy all suppliers. While purchasing departments prefer to use the same solution for as many suppliers as possible, the interviews showed that many suppliers prefer to use as little variety of systems as possible. Often they report the same, saying that they would prefer if the customer used their in-house solution. It seems to be a challenge to achieve a status of mutual satisfaction, as the supply base of an organization differs so much and satisfying all suppliers can be challenging.

8. Theoretical and practical contributions

As introduced in chapter 6., one outcome of this research is the development of a maturity model for the indirect purchasing process. It can be used by purchasing organisations to assess the current status of their indirect purchasing operations. The model aims to set the starting point of further strategy development in purchasing departments. Purchasers can understand the strength and weaknesses in their organisation and derive further actions from it. From a theoretical standpoint, the model added to existing models by focusing on the indirect purchasing process. The results of this thesis showed that indirect purchasing has many particular characteristics, justifying considering it as a separate research topic.

Another suggestion is that COMPANY X is integrating its supplier already in the strategy phase of process implementations. As established before, e-procurement can be a facilitator to improve different operative excellence factors. With a few suppliers this is done, in particular with those who are very experienced in e-procurement and perhaps can offer new solutions to COMPANY X which are not known yet. However, it appears that smaller suppliers are just integrated once to new process is already in the go-live stage. In order to use e-procurement as a tool to improve supplier satisfaction, it seems obvious that suppliers should be integrated into the process and notice some improvements for themselves as well.

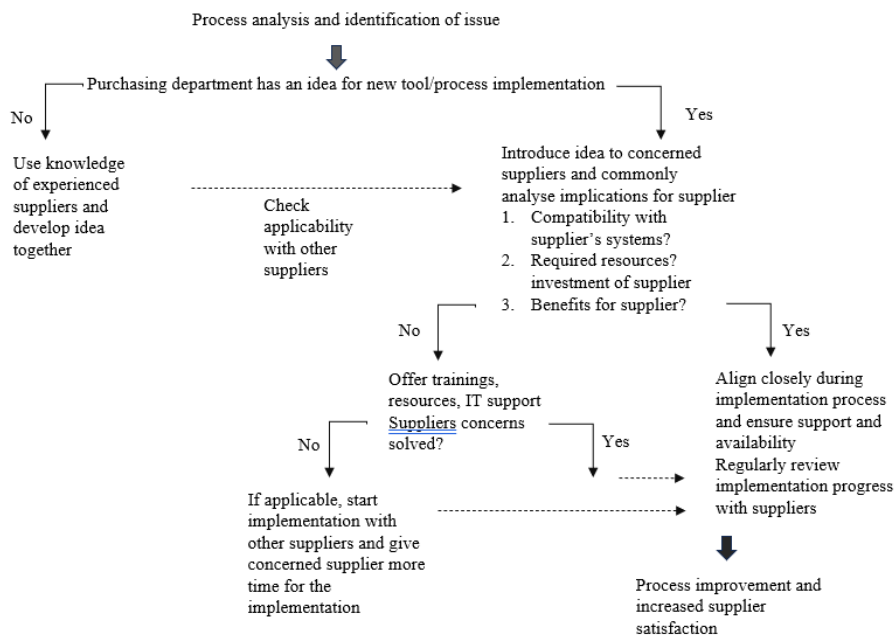


Fig 9. Measures for increasing supplier satisfaction with e-tool implementation

While e-procurement can be a great support to solve operative issues, it is even more crucial for the buying firm to understand the supplier's side of operative processes. Achieving operational excellence is not a one-sided process and both buyer and supplier have particular issues which need to be considered. An example of this can be the often mentioned issue in the RFQ process, where suppliers do not receive feedback on their offers. Referring to a recently implemented RFQ tool by COMPANY X, which can automatically generate an order if the offer is accepted, it would have been practical to integrate a decline option as well. It should be mandatory for the requester to give feedback to the offer, either with an order or a declination. This would be an example, where the buying firm implements a process improvement, but considers the supplier's issues as well and generates benefits for both parties.

Not solely focusing on e-procurement, but generally speaking on process improvements, it can be helpful if buying firm's regularly analyse the purchasing process together with their suppliers to understand weaknesses and commonly look for improvements.

9. Limitations and possibilities for future research

The first limitation of the results is the not representative research sample, as it was based on COMPANY X supplier pool. Most suppliers have a geographical proximity and operate in a similar industry. Nonetheless it should be noted, that the goal of this research was not to be able to make generalizable statements about indirect purchasing. Since the topic of supplier satisfaction is still understudied to this day, this thesis was of an explorative nature, requiring further research in the future.

The developed maturity model is not an all-encompassing model for purchasing maturity and does not attempt to be. It focuses on process aspects as a core topic of this thesis and does not include other relevant purchasing topics such as human resources. In order to fully assess the indirect purchasing maturity, results from other models should be included to create a complete picture. It should be highlighted, that the structure was also based on the purchasing process for direct purchasing, as no established process model exists yet for indirect purchasing. Here it can make sense to question whether this model appropriately reflects the indirect purchasing process and might need some adaptations. Furthermore, maturity the model was developed from the supplier's perspective. Future research could

validate the results by focusing on the purchaser's view as well as testing the model in quantitative research.

The findings on operative excellence antecedents need further verification in quantitative research. Furthermore, this study focused on operative excellence factors. Considering, that the findings showed significant differences between direct and indirect procurement research, it could be worth to explore other supplier satisfaction antecedents more details. So far, the established supplier satisfaction model had been tested in indirect procurement.¹⁹⁹ Further research on developing a separate model on indirect supplier satisfaction is still missing. It can be assumed, that more factors belong to indirect supplier satisfaction than operative excellence, they just have not been identified yet.

Another point to be noted is the discrepancy between the state of the art in digitalisation in academic literature and the implementation state in practice. While the discussion about Industry 4.0 has been ongoing during the last years in literature, the reality is that many small and medium sized companies not even use an ERP system yet. Research on e-procurement has been around for more than 20 years, and it seems still just as relevant today. Of course, it can be assumed that the degree of digitisation and automation depends on factors such as company size and industry. Nonetheless it might be worth to explore this gap further.

¹⁹⁹ Vos et al. (2016)

References

- Accenture. (2022). Supply Chain disruption. Retrieved from <https://www.accenture.com/us-en/insights/consulting/coronavirus-supply-chain-disruption>
- Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it. *Indian Journal of Medical Specialties*, 4(2), 330-333.
- Alghababsheh, M., & Gallear, D. (2020). Social capital in buyer-supplier relationships: A review of antecedents, benefits, risks, and boundary conditions. *Industrial Marketing Management*, 91, 338-361. doi:<https://doi.org/10.1016/j.indmarman.2020.10.003>
- Allal-Chérif, O., Simón-Moya, V., & Ballester, A. C. C. (2021). Intelligent purchasing: How artificial intelligence can redefine the purchasing function. *Journal of Business Research*, 124, 69-76. doi:<https://doi.org/10.1016/j.jbusres.2020.11.050>
- Andrade, C. (2021). The Inconvenient Truth About Convenience and Purposive Samples. *Indian Journal of Psychological Medicine*, 43(1), 86-88. doi:10.1177/0253717620977000
- Appiah, L. O., & Lartey, F. A. (2019). Examining the Impact Records Keeping, Information Sharing and Partner Relations on Procurement Performance in Firms. *International Journal of Business Strategy and Social Sciences*, 2(1), 10-23.
- Aspers, P., & Corte, U. (2019). What is Qualitative in Qualitative Research. *Qualitative Sociology*, 42(2), 139-160. doi:10.1007/s11133-019-9413-7
- Bäckstrand, J., Suurmond, R., van Raaij, E., & Chen, C. (2019). Purchasing process models: Inspiration for teaching purchasing and supply management. *Journal of Purchasing and Supply Management*, 25(5), 100577. doi:<https://doi.org/10.1016/j.pursup.2019.100577>
- Baglieri, E., Secchi, R., & Croom, S. (2007). Exploring the impact of a supplier portal on the buyer-supplier relationship. The case of Ferrari Auto. *Industrial Marketing Management*, 36(7), 1010-1017. doi:<https://doi.org/10.1016/j.indmarman.2007.06.005>
- Barry, J., Cavinato, J. L., Green, A., & Young, R. R. (1996). A Development Model for Effective MRO Procurement. *International Journal of Purchasing and Materials Management*, 32(2), 35-44. doi:<https://doi.org/10.1111/j.1745-493X.1996.tb00284.x>
- Batenburg, R., & Versendaal, J. (2008). Maturity matters: Performance determinants of the procurement business function.
- Baxter, R. (2012). How can business buyers attract sellers' resources?: Empirical evidence for preferred customer treatment from suppliers. *Industrial Marketing Management*, 41(8), 1249-1258. doi:<https://doi.org/10.1016/j.indmarman.2012.10.009>

- Bechtel, C., & Patterson, J. L. (1997). MRO Partnerships: A Case Study. *International Journal of Purchasing and Materials Management*, 33(2), 18-23. doi:<https://doi.org/10.1111/j.1745-493X.1997.tb00027.x>
- Becker, J., Knackstedt, R., & Pöppelbuß, J. (2009). Developing Maturity Models for IT Management. *Business & Information Systems Engineering*, 1(3), 213-222. doi:10.1007/s12599-009-0044-5
- Bhatta, T. P. (2018). Case study research, philosophical position and theory building: A methodological discussion. *Dhaulagiri Journal of Sociology and Anthropology*, 12, 72-79.
- Brandon-Jones, A., & Kauppi, K. (2018). Examining the antecedents of the technology acceptance model within e-procurement. *International Journal of Operations & Production Management*, 38(1), 22-42. doi:10.1108/IJOPM-06-2015-0346
- Cardoso, A. L., & Biazzin, C. (2020). What is the value of e-procurement for suppliers? The drivers, barriers and opportunities for engaging MRO suppliers. *International Journal of Procurement Management*, 13(2), 278-297.
- Carvalho, A. M., Sampaio, P., Rebentisch, E., Carvalho, J. Á., & Saraiva, P. (2019). Operational excellence, organisational culture and agility: the missing link? *Total Quality Management & Business Excellence*, 30(13-14), 1495-1514. doi:10.1080/14783363.2017.1374833
- Cox, A., Chicksand, D., Ireland, P., & Davies, T. (2005). Sourcing Indirect Spend: A Survey of Current Internal and External Strategies for Non-Revenue-Generating Goods and Services. *Journal of Supply Chain Management*, 41(2), 39-51. doi:<https://doi.org/10.1111/j.1055-6001.2005.04102004.x>
- Croom, S. R. (2000). The Impact of Web-Based Procurement on the Management of Operating Resources Supply. *Journal of Supply Chain Management*, 36(4), 4-13. doi:<https://doi.org/10.1111/j.1745-493X.2000.tb00065.x>
- Cuylen, A., Kosch, L., & Breitner, M. H. (2016). Development of a maturity model for electronic invoice processes. *Electronic Markets : The International Journal on Networked Business*, 26(2), 115-127. doi:10.1007/s12525-015-0206-x
- de Boer, L., Harink, J., & Heijboer, G. (2002). A conceptual model for assessing the impact of electronic procurement. *European Journal of Purchasing & Supply Management*, 8(1), 25-33. doi:[https://doi.org/10.1016/S0969-7012\(01\)00015-6](https://doi.org/10.1016/S0969-7012(01)00015-6)
- de Boer, L., Holmen, E., & Pop-Sitar, C. (2003). Purchasing as an organizational design problem: the case of non-product-related items and services. *Management Decision*, 41(9), 911-922. doi:10.1108/00251740310500903
- Delke, V., Schiele, H., & Buchholz, W. (2023). Differentiating between direct and indirect procurement: roles, skills, and Industry 4.0. *International Journal of Procurement Management*, 16(1), 1-30.
- Dev, N. K., Shankar, R., & Qaiser, F. H. (2020). Industry 4.0 and circular economy: Operational excellence for sustainable reverse supply chain performance. *Resources, Conservation and Recycling*, 153, 104583. doi:<https://doi.org/10.1016/j.resconrec.2019.104583>

- DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147-160. doi:10.2307/2095101
- Ebneyamini, S., & Sadeghi Moghadam, M. R. (2018). Toward Developing a Framework for Conducting Case Study Research. *International journal of qualitative methods*, 17(1), 1609406918817954. doi:10.1177/1609406918817954
- Eisenhardt, K. M. (2020). Theorizing from Cases: A Commentary. In L. Eden, B. B. Nielsen, & A. Verbeke (Eds.), *Research Methods in International Business* (pp. 221-227). Cham: Springer International Publishing.
- Erriquez, M., de La Boulaye, P., Bago, M., Ibanez, P., Santos, R., & Vaghi, A. (2019). Revolutionizing indirect procurement for the 2020s. *Verfügbar unter <https://www.mckinsey.com/business-functions/operations/our-insights/revolutionizing-indirect-procurement-for-the-2020s>* (abgerufen am 27.
- Essig, M., & Amann, M. (2009). Supplier satisfaction: Conceptual basics and explorative findings. *Journal of Purchasing and Supply Management*, 15(2), 103-113. doi:<https://doi.org/10.1016/j.pursup.2009.01.001>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International journal of qualitative methods*, 5(1), 80-92. doi:10.1177/160940690600500107
- Foroughi, A. (2008). MRO and eProcurement: Opportunities and Challenges. *University of Southern Indiana*.
- Found, P., Lahy, A., Williams, S., Hu, Q., & Mason, R. (2018). Towards a theory of operational excellence. *Total Quality Management & Business Excellence*, 29(9-10), 1012-1024. doi:10.1080/14783363.2018.1486544
- Gauthier, J. (2013). Institutional Theory and Corporate Sustainability: Determinant Versus Interactive Approaches. *Organization Management Journal*, 10(2), 86-96. doi:10.1080/15416518.2013.801741
- Gebauer, J., & Segev, A. (2000). Emerging technologies to support indirect procurement: two case studies from the petroleum industry. *Information Technology and Management*, 1(1), 107-128. doi:10.1023/A:1019160605755
- Ghijzen, P. W. T., Semeijn, J., & Ernstson, S. (2010). Supplier satisfaction and commitment: The role of influence strategies and supplier development. *Journal of Purchasing and Supply Management*, 16(1), 17-26. doi:<https://doi.org/10.1016/j.pursup.2009.06.002>
- Glas, A. H., & Kleemann, F. C. (2016). The impact of industry 4.0 on procurement and supply management: A conceptual and qualitative analysis. *International Journal of Business and Management Invention*, 5(6), 55-66.

- Glavee-Geo, R. (2019). Does supplier development lead to supplier satisfaction and relationship continuation? *Journal of Purchasing and Supply Management*, 25(3), 100537. doi:<https://doi.org/10.1016/j.pursup.2019.05.002>
- Graven, B. Mitigating maverick buying at Medtronic.
- Hartley, J. L., Sawaya, W., & Dobrzykowski, D. (2022). Exploring blockchain adoption intentions in the supply chain: perspectives from innovation diffusion and institutional theory. *International Journal of Physical Distribution & Logistics Management*, 52(2), 190-211. doi:10.1108/IJPDLM-05-2020-0163
- Helmold, M., & Dathe, T. (2023). Qualitätsmanagement im Einkauf und Lieferantenmanagement. In *Qualität neu denken: Innovative, virtuelle und agile Ansätze entlang der Wertschöpfungskette* (pp. 257-272). Wiesbaden: Springer Fachmedien Wiesbaden.
- Herbert J. Rubin, I. S. R. (2005). Qualitative Interviewing (2nd ed.): The Art of Hearing Data. In (2nd ed.). doi:10.4135/9781452226651
- Holma, A.-M., & Bask, A. (2012). *Monitoring public procurement of corporate travel services-a triadic perspective*. Paper presented at the Italy: the 28th IMP-conference.
- Hopf, C. (2004). Qualitative interviews: An overview. *A companion to qualitative research*, 203(8), 100093.
- Hüttinger, L., Schiele, H., & Schröer, D. (2014). Exploring the antecedents of preferential customer treatment by suppliers: a mixed methods approach. *Supply Chain Management: An International Journal*, 19(5/6), 697-721. doi:10.1108/SCM-06-2014-0194
- Ilkay, S. (2019). *Operative excellence in buyer-supplier relationships: The influence of operative antecedents on supplier satisfaction*. University of Twente,
- Israel, D., & Curkovic, S. (2020). Indirect Procurement: A Literature Review and Study of Trends. *American Journal of Industrial and Business Management*, 10(04), 775. doi:<https://doi.org/10.4236/ajibm.2020.104052>
- Jaeger, A., & Matyas, K. (2016). Transformation of the EFQM approach from business towards operations excellence. *Production Engineering*, 10(3), 277-291. doi:10.1007/s11740-016-0665-8
- Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954-2965. doi:<https://doi.org/10.1111/jan.13031>
- Kampik, T., & Hilton, P. (2019). *Towards social robotic process automation*. Paper presented at the SIAS Conference.
- Kappert, R. (2020). *The development of a maturity model to support the assessment and evaluation of the purchasing department in the field of innovation*. University of Twente,
- Karjalainen, K., Kemppainen, K., & Van Raaij, E. M. (2009a). Non-compliant work behaviour in purchasing: An exploration of reasons behind maverick buying. *Journal of Business Ethics*, 85, 245-261.

- Karjalainen, K., Kemppainen, K., & Van Raaij, E. M. (2009b). Non-compliant work behaviour in purchasing: An exploration of reasons behind maverick buying. *Journal of Business Ethics*, 85(2), 245-261.
- Karjalainen, K., & van Raaij, E. M. (2011). An empirical test of contributing factors to different forms of maverick buying. *Journal of Purchasing and Supply Management*, 17(3), 185-197. doi:<https://doi.org/10.1016/j.pursup.2011.05.001>
- Kauppi, K. (2013). Extending the use of institutional theory in operations and supply chain management research. *International Journal of Operations & Production Management*, 33(10), 1318-1345. doi:10.1108/IJOPM-10-2011-0364
- Khuan, L. S., & Swee, M. (2018). Technologies for Procurement: Current Trends and Emerging Trends. *Emerging Technologies for Supply Chain Management*, 4, 45-61.
- Kim, J.-I., & Shunk, D. L. (2004). Matching indirect procurement process with different B2B e-procurement systems. *Computers in Industry*, 53(2), 153-164. doi:<https://doi.org/10.1016/j.compind.2003.07.002>
- Kim, M., Suresh, N. C., & Kocabasoglu-Hillmer, C. (2015). A contextual analysis of the impact of strategic sourcing and E-procurement on performance. *Journal of Business & Industrial Marketing*, 30(1), 1-16. doi:10.1108/JBIM-01-2012-0010
- Kingsman, B. (1983). The effect of payment rules on ordering and stockholding in purchasing. *Journal of the Operational Research society*, 34(11), 1085-1098.
- Korsakienė, R., Diskienė, D., & Smaliukienė, R. (2015). Institutional theory perspective and internationalization of firms. How institutional context influences internationalization of SMEs? *Entrepreneurship and sustainability issues*, 2(3).
- Kwon, S.-D., Yang, H.-D., & Rowley, C. (2009). The Purchasing Performance of Organizations Using e-Marketplaces. *British Journal of Management*, 20(1), 106-124. doi:<https://doi.org/10.1111/j.1467-8551.2007.00555.x>
- Le Sueur, M., & Dale, B. G. (1998). The procurement of maintenance, repair and operating supplies: a study of the key problems. *European Journal of Purchasing & Supply Management*, 4(4), 247-255. doi:[https://doi.org/10.1016/S0969-7012\(98\)00016-1](https://doi.org/10.1016/S0969-7012(98)00016-1)
- Leung, K. H., Luk, C. C., Choy, K. L., Lam, H. Y., & Lee, C. K. M. (2019). A B2B flexible pricing decision support system for managing the request for quotation process under e-commerce business environment. *International Journal of Production Research*, 57(20), 6528-6551. doi:10.1080/00207543.2019.1566674
- Liinajarja, K., & Kaipia, R. (2023). Indirect procurement management: Maturity model development and validation.
- Manello, A., & Calabrese, G. (2019). The influence of reputation on supplier selection: An empirical study of the European automotive industry. *Journal of Purchasing and Supply Management*, 25(1), 69-77. doi:<https://doi.org/10.1016/j.pursup.2018.03.001>

- Matthews, D. (2005). Strategic procurement in the public sector: A mask for financial and administrative policy. *Journal of Public Procurement*, 5(3), 388-399. doi:10.1108/JOPP-05-03-2005-B005
- Mayring, P. (2004). Qualitative content analysis. *A companion to qualitative research*, 1(2), 159-176.
- McIntosh, M. J., & Morse, J. M. (2015). Situating and Constructing Diversity in Semi-Structured Interviews. *Global Qualitative Nursing Research*, 2, 2333393615597674. doi:10.1177/2333393615597674
- Mikalef, P., Pateli, A., Batenburg, R. S., & Wetering, R. v. d. (2015). Purchasing alignment under multiple contingencies: a configuration theory approach. *Industrial Management & Data Systems*, 115(4), 625-645. doi:10.1108/IMDS-10-2014-0298
- Min, H., & Galle, W. P. (2003). E-purchasing: profiles of adopters and nonadopters. *Industrial Marketing Management*, 32(3), 227-233. doi:[https://doi.org/10.1016/S0019-8501\(02\)00266-3](https://doi.org/10.1016/S0019-8501(02)00266-3)
- Morash, E. A., & Clinton, S. R. (1998). Supply Chain Integration: Customer Value through Collaborative Closeness versus Operational Excellence. *Journal of Marketing Theory and Practice*, 6(4), 104-120. doi:10.1080/10696679.1998.11501814
- Morsinkhof, P. (2018). *Assessing E-Procurement maturity as designed in an E-Procurement Maturity Model and Quadrant Model*. University of Twente,
- Nawi, M. N. M., Roslan, S., Salleh, N. A., Zulhumadi, F., & Harun, A. N. (2016). The benefits and challenges of E-procurement implementation: a case study of Malaysian company. *International Journal of Economics and Financial Issues*, 6(7S), 329-332.
- Niederschweiberer, R., & Kleemann, F. C. (2020). Auswirkungen von Industrie 4.0 auf den indirekten Einkauf: eine empirische Analyse. In *Supply Management Research* (pp. 221-255): Springer.
- Nollet, J., Rebolledo, C., & Popel, V. (2012). Becoming a preferred customer one step at a time. *Industrial Marketing Management*, 41(8), 1186-1193. doi:<https://doi.org/10.1016/j.indmarman.2012.10.003>
- Patrucco, A. S., Luzzini, D., Moretto, A., & Ronchi, S. (2019). Attraction in buyer-supplier relationships. *Business Process Management Journal*, 25(2), 347-367. doi:10.1108/BPMJ-06-2017-0137
- Patton, M. Q. (2002). Two Decades of Developments in Qualitative Inquiry:A Personal, Experiential Perspective. *Qualitative Social Work*, 1(3), 261-283. doi:10.1177/1473325002001003636
- Piechota, S., Glas, A. H., & Essig, M. (2021). Questioning the relevance of supplier satisfaction for preferred customer treatment: Antecedent effects of comparative alternatives and multi-dimensionality. *Journal of Purchasing and Supply Management*, 27(1), 100672. doi:<https://doi.org/10.1016/j.pursup.2021.100672>

- Pierre de la Boulaye, M. E., Manuel Gener Bago, Patricio Ibáñez, Raul Santos, Alfredo Vaghi. (2019). Revolutionizing indirect procurement for the 2020's. *McKinsey*.
- Pohl, M., & Förstl, K. (2011). Achieving purchasing competence through purchasing performance measurement system design—A multiple-case study analysis. *Journal of Purchasing and Supply Management*, 17(4), 231-245. doi:<https://doi.org/10.1016/j.pursup.2011.04.001>
- Poulis, K., Poulis, E., & Plakoyiannaki, E. (2013). The role of context in case study selection: An international business perspective. *International Business Review*, 22(1), 304-314. doi:<https://doi.org/10.1016/j.ibusrev.2012.04.003>
- Presutti, W. D. (2003). Supply management and e-procurement: creating value added in the supply chain. *Industrial Marketing Management*, 32(3), 219-226. doi:[https://doi.org/10.1016/S0019-8501\(02\)00265-1](https://doi.org/10.1016/S0019-8501(02)00265-1)
- Pulles, N. J., Schiele, H., Veldman, J., & Hüttinger, L. (2016). The impact of customer attractiveness and supplier satisfaction on becoming a preferred customer. *Industrial Marketing Management*, 54, 129-140. doi:<https://doi.org/10.1016/j.indmarman.2015.06.004>
- Puschmann, T., & Alt, R. (2005). Successful use of e-procurement in supply chains. *Supply Chain Management: An International Journal*, 10(2), 122-133. doi:10.1108/13598540510589197
- Rafati, L., & Poels, G. (2017). Value-Driven Strategic Sourcing Based on Service-Dominant Logic. *Service Science*, 9(4), 275-287. doi:10.1287/serv.2017.0190
- Rashid, Y., Rashid, A., Warraich, M. A., Sabir, S. S., & Waseem, A. (2019). Case study method: A step-by-step guide for business researchers. *International journal of qualitative methods*, 18, 1609406919862424.
- Ridder, H.-G. (2017). The theory contribution of case study research designs. *Business Research*, 10(2), 281-305. doi:10.1007/s40685-017-0045-z
- Rothkopf, A., & Pibernik, R. (2016). Maverick buying: Eliminate, participate, leverage? *International Journal of Production Economics*, 179, 77-89. doi:<https://doi.org/10.1016/j.ijpe.2016.05.020>
- Rozemeijer, F. (2008). Purchasing myopia revisited again? *Journal of Purchasing and Supply Management*, 14(3), 205-207. doi:<https://doi.org/10.1016/j.pursup.2008.06.001>
- Schiele, H. (2007). Supply-management maturity, cost savings and purchasing absorptive capacity: Testing the procurement–performance link. *Journal of Purchasing and Supply Management*, 13(4), 274-293. doi:<https://doi.org/10.1016/j.pursup.2007.10.002>
- Schiele, H. (2012). Accessing Supplier Innovation By Being Their Preferred Customer. *Research-Technology Management*, 55(1), 44-50. doi:10.5437/08956308X5501012
- Schiele, H. (2019). Purchasing and supply management. In *Operations, logistics and supply chain management* (pp. 45-73): Springer.

- Schiele, H. (2020). Comparing public and private organisations in their quest to become a preferred customer of suppliers. *Journal of Public Procurement*, 20(2), 119-144. doi:10.1108/JOPP-10-2018-0041
- Schiele, H., Calvi, R., & Gibbert, M. (2012). Customer attractiveness, supplier satisfaction and preferred customer status: Introduction, definitions and an overarching framework. *Industrial Marketing Management*, 41(8), 1178-1185. doi:<https://doi.org/10.1016/j.indmarman.2012.10.002>
- Schweiger, J. (2014). *A theory-based perspective on Maturity Models in Purchasing and Supply Management*. Paper presented at the Innovative Methods in Logistics and Supply Chain Management: Current Issues and Emerging Practices. Proceedings of the Hamburg International Conference of Logistics (HICL), Vol. 18.
- Scott, M. A., Burke, G., & Szmerekovsky, J. (2018). "Do as I Do and Not as I Say": Exploring Price-Oriented Maverick Buying During Supplier Selection. *Decision Sciences*, 49(1), 25-64. doi:<https://doi.org/10.1111/dec.12262>
- Seyedghorban, Z., Samson, D., & Tahernejad, H. (2020). Digitalization opportunities for the procurement function: pathways to maturity. *International Journal of Operations & Production Management*, 40(11), 1685-1693. doi:10.1108/IJOPM-04-2020-0214
- Smadi, Z. M. A., & Ababneh, H. T. (2018). Toward realizing operational excellence through e-procurement adoption a resource based view. *Global Journal of Management and Business Research*.
- Soares-Aguiar, A., & Palma-dos-Reis, A. (2008). Why Do Firms Adopt E-Procurement Systems? Using Logistic Regression to Empirically Test a Conceptual Model. *IEEE Transactions on Engineering Management*, 55(1), 120-133. doi:10.1109/TEM.2007.912806
- Sony, M. (2019). Implementing sustainable operational excellence in organizations: an integrative viewpoint. *Production & Manufacturing Research*, 7(1), 67-87. doi:10.1080/21693277.2019.1581674
- Spina, G., Caniato, F., Luzzini, D., & Ronchi, S. (2016). Assessing the use of External Grand Theories in Purchasing and Supply Management research. *Journal of Purchasing and Supply Management*, 22(1), 18-30. doi:<https://doi.org/10.1016/j.pursup.2015.07.001>
- Steinle, C., & Schiele, H. (2008). Limits to global sourcing?: Strategic consequences of dependency on international suppliers: Cluster theory, resource-based view and case studies. *Journal of Purchasing and Supply Management*, 14(1), 3-14. doi:<https://doi.org/10.1016/j.pursup.2008.01.001>
- Ströhnisch, F. (2019). *Development of a Maturity-and Quadrant Model to Assess and Classify E-purchasing solutions*. University of Twente,
- Tan, L. K., & Goh, S. H. (2017). A Price Review Framework for Maintenance, Repair and Operations Procurement Contracts in the Public Sector. In *Global Public Procurement Theories and Practices* (pp. 173-198): Springer.

- Úbeda, R., Alsua, C., & Carrasco, N. (2015). Purchasing models and organizational performance: a study of key strategic tools. *Journal of Business Research*, 68(2), 177-188. doi:<https://doi.org/10.1016/j.jbusres.2014.09.026>
- Van Poucke, E., van Weele, A. J., & Matthyssens, P. (2014). *The interrelationship between purchasing maturity, internal customer satisfaction and purchasing performance: an empirical study*. Paper presented at the Working paper presented at the 23rd Annual IPSERA Conference, April 13-16th 2014, University of South Africa, Pretoria.
- Vos, F. G. S., Schiele, H., & Hüttinger, L. (2016). Supplier satisfaction: Explanation and out-of-sample prediction. *Journal of Business Research*, 69(10), 4613-4623. doi:<https://doi.org/10.1016/j.jbusres.2016.04.013>
- Wagner, S. M., & Essig, M. (2006). Electronic procurement applications and their impact on supplier relationship management. *International Journal of Services Technology and Management*, 7(5-6), 439-462.
- Waithaka, R. K., & Kimani, J. G. (2021). EFFECT OF E-PROCUREMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE. *Global Journal of Purchasing and Procurement Management*, 1(1), 32 - 42. doi:10.47604/gjppm.1200
- Wan, Z., & Beil, D. R. (2009). RFQ Auctions with Supplier Qualification Screening. *Operations Research*, 57(4), 934-949. doi:10.1287/opre.1080.0657
- Weller, S. B. M., Pulles, N. J., & Zunk, B. M. (2021). The micro-processes of supplier satisfaction: A longitudinal multiple case study. *Journal of Purchasing and Supply Management*, 27(4), 100711. doi:<https://doi.org/10.1016/j.pursup.2021.100711>
- Willmott, H. (2015). Why Institutional Theory Cannot Be Critical. *Journal of Management Inquiry*, 24(1), 105-111. doi:10.1177/1056492614545306
- Yu, S., Mishra, A. N., Gopal, A., Slaughter, S., & Mukhopadhyay, T. (2015). E-Procurement Infusion and Operational Process Impacts in MRO Procurement: Complementary or Substitutive Effects? *Production and Operations Management*, 24(7), 1054-1070. doi:<https://doi.org/10.1111/poms.12362>
- Zimmermann, F., & Foerstl, K. (2014). A Meta-Analysis of the "Purchasing and Supply Management Practice-Performance Link". *Journal of Supply Chain Management*, 50(3), 37-54. doi:<https://doi.org/10.1111/jscm.12051>
- Zunk, B., Marchner, M., Uitz, I., Lerch, C., & Schiele, H. (2014). The role of E-procurement in the Austrian construction industry: Adoption rate, benefits and barriers. *International journal of industrial engineering and management*, 5(1), 13.

Appendix 1: Maturity model

Indirect purchasing process - maturity model completed by _____
 Based on Schiele (2007), Schiele (2019)

Function	Questions for Analysis	% observed	points (1-20)	Comments	Stage 1 (0%-25%)	Stage 2 (26%-50%)	Stage 3 (51%-75%)	Stage 4 (76%-100%)
Planning supply		0%	0.0					
Internal planning and alignment		0%	0.0					
Cost analysis and savings	Is there a system set up for monitoring costs and savings of indirect products?				Cost developments and savings are not systematically monitored.	Savings are tracked manually by comparing offer and negotiation result.	Savings for standard articles are tracked and cost developments can be monitored over time. For non-standard articles (services, tools, invests) price developments are not followed.	Spend planning is executed fully assisted by data available in the ERP system. Algorithms help to analyse trends in article and supplier price evolutions. Savings are transparent.
Commodity management	Is there a commodity management system in place? Is indirect spend clearly divided into commodities? Do you use commodity management to support strategy formulation?				There is no commodity management in place. Purchasers are responsible for requests as they come in and not based on assigned commodities.	Large suppliers are divided into broad categories such as MRO and Services. There are a lot of undefined suppliers. Purchasing responsibilities are not clearly assigned to commodities.	Most suppliers are categorised into a commodity. Commodity management is still broad, but responsibilities within purchasing are divided.	There is a detailed commodity management in place. Every supplier is assigned to a commodity and vice versa there is a purchaser responsible for the commodity. Individual commodity strategies are developed.
Demand planning and forecasting		0%	0.0					
Internal alignment	Is budget planning done cross-functionally? Is planning and target definition led by purchasing?				There is no cross-functional collaboration in the planning process. Each department defines their own indirect spend budget.	Each department is responsible for budget definition, which is communicated to purchasing.	Purchasing and internal stakeholders communicate regularly. Departments are responsible for their budget, but alignment meetings with purchasing are standard.	Purchasing and internal stakeholders are fully aligned. Purchasing is leading the budget planning process but works fully cross-functional. A budget review is taking place typically every quarter to check on developments.
Forecasting and demand planning	Do you share forecasts of indirect materials with your suppliers?				Purchasing does not actively develop and share forecasts with the suppliers	For standard articles, forecasts are shared with suppliers through the ERP system. For non-standard articles, forecasts cannot be shared.	For standard articles, forecasts are shared with suppliers through the ERP system. For non-standard articles, forecasts cannot be shared. To compensate for that, purchasing organised reviews throughout the year	Through usage of AI and complex algorithms the buying organisation provides the suppliers forecasts for every product. Changes in demand are visible for the supplier immediately and there is an appropriate frozen zone. In rare cases

Supply base management	Is there a defined (preferred) supply base? Are there limits for onboarding new suppliers?				There is no structured overview on onboarded suppliers and their capabilities. Internal customers choose suppliers based on every individual needs, they do not need to be onboarded.	Internal customers choose suppliers based on their individual needs. Suppliers need to be onboarded before ordering. There is no overview on existing supplier's capabilities, therefore new suppliers are onboarded continuously.	Supplier data is centralized to some extent, e.g. in an excel file, with improving accessibility for relevant teams. The data has to be maintained manually. Supplier onboarding is required before ordering.	There are selected (preferred) suppliers for every commodity. The supplier data is accessible to everyone in the organisation. There is transparency on a supplier's capabilities and product offer in a central data base which is continuously updated. It helps internal customers to find the correct supplier for their demand. Suppliers only need to be onboarded on rare occasions.
Supplier selection criteria	Do you have established supplier selection criteria? Is there a minimum amount of offers needed? Do you have other criteria which need to be considered besides price? How are they weighted?				There are no set supplier selection criteria. Supplier selection is based off requester's preference and is usually decided based on price.	Usually supplier selection is based off hard facts such as price and delivery. This data is collected and compared by the purchasing department.	Hard and soft criteria are considered in the supplier selection process. Comparison matrix exists, however the input data needs to be collected manually	Supplier selection is based on multiple hard and soft criteria. Hard criteria such as price, quality, delivery is available in the system. Soft criteria like communication and strategic importance are considered. All data and statistics about the supplier are available in the system and continuously updated. Accessibility is given to all relevant users and decision makers within the organisation.
Tendering		0%	0.0					
RFQ activities	To what degree is the RFQ process digitalised? Is there a minimum amount of offers required? Are there standards in the organisations how RFQs have to be sent to suppliers?				RFQs reach the supplier usually via mail, or telephone. There is no standardisation and purchasing involvement not required.	RFQ tools exist, but are used mostly only by purchasing. Internal requestors still send out requests to suppliers through different channels.	Tools for RFQs exist, but not all users are trained, therefore there is no standardized way of sending out RFQs. Multiple offers are needed in case the demand exceeds a certain value.	There are standardized tools which have to be used for RFQs. The tool allows the requestor to send out the RFQ himself to pre-selected suppliers. This process is fully monitored by purchasing. Above a certain value, offers from multiple suppliers are needed.
Supplier feedback	Do you provide feedback to your supplier for every offer?				Feedback for offers is generally not part of the purchasing process. Suppliers only receive feedback after actively requesting it. Usually this only is the case for high value items.	Usually an offer feedback is given to the supplier. In many cases this happens only after supplier specifically requests	Every suppliers' offer received a feedback. This is part of the defined purchasing process. Feedback is usually given manually, via e-mail or phone.	Every supplier's offer receives a feedback, not dependent on value. The feedback function is integrated in the RFQ tool, and every request needs to be finished with a feedback in order to be closed.
Role of purchasing		0%	0.0					
Involvement of purchasing in supplier selection	Is purchasing involved in supplier selection process? Is the role of purchasing operative or strategic?				The supplier decision is made by the internal customer on an ad-hoc basis.	The internal customer pre-defines the wished supplier and sends this information to purchasing for checking. Purchasing usually approves pre-defined supplier.	Internal customers inform purchasing about their wished supplier. Purchasing applies their own evaluation criteria and check to what extent the supplier decision fits into their purchasing strategy. The decision is made commonly.	Purchasing is fully integrated in the supplier selection process. Criteria are commonly defined between purchasing and concerned departments. The purchasing department is the central point to bring together all departments and makes the final decision. This is supported by the organization's
Negotiation responsibility	Is purchasing responsible for negotiation? Are there clearly defined authority guidelines for negotiation processes?				Authority guidelines are missing. Offers are not negotiated, purchasing places the order according to internal customer's demands.	Negotiations are used based on the budget situation, where savings are needed. The demand is given by the internal customer to the purchaser. There is no defined purchasing value which requires a negotiation.	A purchase value which requires negotiation exists. This can be done by the internal customer or the purchaser.	There are clear authority guidelines for every purchasing scenario. Above a certain value, every product or service is negotiated. All negotiations are only done by the purchasing department. Advanced negotiation tactics are used where appropriate.

Contracting supplier		0%	0.0					
Frame contracts	Are frame contracts closed with every supplier? Are contractual conditions always maintained and updated?				Frame contracts are generally not closed with suppliers	With important suppliers or high value projects frame contracts are closed.	Frame contracts are established with a wide range of strategic suppliers.	All onboarded suppliers have a frame contract. The validity date and other conditions are constantly kept up to date. A frame contract is a prerequisite to enter a business relationship with a supplier.
Storage of documents	Is there a central storage of contracts existing? Is it accessible and known across the organisation?				No central storage option available, storage location is responsibility of every purchaser	Common storage solution for the purchasing organisation, such as a sharepoint. No specific contract management system is used and accessibility is limited.	Storage in ERP system is available in a designated contract management system. Upload is responsibility of each purchaser. Access is limited to purchasing.	Central storage of all documents in the ERP system. Upload of documents happens automatically after electronic signature. Contracts are accessible for every authorised person in the organisation.
Contract template management	Do you have templates for supplier frame contracts? To what extent do you make use of AI to keep contracts updated?				Documents are created as they are needed, without sufficient legal support. Often the supplier's standard documents are signed.	Templates for basic contracts such as NDAs exist. The templates are not regularly updated.	A variety of templates exist. The content is created with legal support, such as in-house lawyers and regularly updated.	Contract templates are created through AI and double checked by the legal department. All purchasers have access to templates. Changing legal requirements are automatically integrated into contract templates.

Ordering material		0%	0.0					
Orders approvals		0%	0.0					
Order requisition process	Are orders always preceded by purchase requisitions? Are approval guidelines clear? Is the approval process managed through the ERP system?				Orders can be placed also without a requisition process. If approvals are collected, it is usually done manually (through e-mail, oral approvals). No clear approval guidelines exist.	Generally order requisitions are required for placing purchase orders, but there is no defined workflow for the approval process. From technical perspective it is possible to place orders without a requisition.	Order requisition workflow goes through the ERP system and can be directly linked with the purchase order. It is possible to place purchase orders without an order requisition. The process is user friendly and known to most relevant people in the organisation.	Order requisition workflow goes through the ERP system and can be directly linked with the purchase order. The requisition is created automatically based on the offer. It is not possible to place purchase orders without an order requisition. The process is user friendly and known for all relevant people in the organisation. The only manual input that is needed, to approve the requisition.
Digitisation and Automation of ordering process		0%	0.0					
E-Catalogues and marketplaces	Do you use catalogues for standard articles? Do all requesters internally have access to catalogues?				E-Catalogues do not exist, all articles are ordered manually through purchase requisitions and purchase orders. Some requestors order through supplier's catalogues directly (Maverick Buying)	Access to supplier's catalogues exists. Orders are only placed by the purchasing department.	There is a mix between supplier's catalogue and customer marketplaces. Not all suppliers are integrated into the e-marketplace of the organisation	All standard articles are included in e-catalogues. There is a central e-market where catalogues from all suppliers are uploaded. All requesters are sufficiently trained to use catalogues. Purchasing's only involvement are price negotiations.
Automation	For high consumption parts (workers' gear, small tools, office supplies) do automated replenishment systems exist?				All products' stocks are checked and ordered manually	A lot of manual checking of stock is necessary. Standard items stock can be checked in the ERP system, replenishment is a manual process due to lack of connectedness to the supplier's system.	Auto replenishment only exists for special products such as industrial gas supply. For MRO articles, information on stock is available and needs to be ordered manually.	Consumables are automatically replenished. Depending on the type of consumable there are storage and issue of goods points such as vending machines. Consumers can take goods by themselves after identification. When the stock reaches a certain threshold, the contracted supplier takes care of refilling and is fully in his responsibility. The replenishment system is a direct interface between buyer and supplier.
Integration into supplier's ERP systems	To what extent are your orders integrated in the supplier's ERP system? Do you use EDI? Do you actively make suggestions for harmonisation?				There is no harmonised ordering process. Orders are sent through different channels, often via e-mail as a pdf.	There is a variety of options how data is exchanged with suppliers. Sometimes e-mails with pdf attachments are sent, other times an e-mail is generated from SAP	With many suppliers an EDI connection exists. Sometimes orders have to be sent via e-mail in case the supplier is not connected to EDI.	The entire ordering process is harmonised. Through possibilities such as EDI information gets exchanged in real time and requires no manual transfer of data.

Expediting order		0%	0.0					
Order status	Are you and your suppliers' systems interconnected? Can the order status be checked? Is this information available within your own ERP system?				It is not usual that the order status is shared. Only in case of urgencies or delays the requester contacts the supplier for receiving updates in the order.	The ERP system allows suppliers to maintain the current order or production status. The availability and accuracy of the data depends on the supplier's efforts.	For standard and catalogue articles the solution allows to check the current status of the order. The status for non-standard articles needs to be updated manually.	The supplier's and buyer's systems are interconnected, so the order status can be always checked on request. Real time information from the supplier's production or warehouse is shared.
Shipping and delivery notice	Do your internal customers get a notification when their order arrives? Is it clearly identifiable?				Requesters do not receive information when parts are shipped or arrive. Often it takes a while until the parts reach the requester or they get lost as they cannot be matched to a purchase order.	Normally the purchaser receives a delivery note and manually forwards this information to the requester.	Most shipments can be tracked. The notice requires still manual input from the supplier	As soon as the part gets shipped, an automatic information gets send to the requester. He is constantly able to monitor the delivery and as soon as the part arrives gets notice.
Paying delivery		0%	0.0					
Payment process		0%	0.0					
Electronic invoicing	Do supplier invoices arrive electronically? Are they sent to a central mail address in the accounting department? Does your system support automatic matching and paying of invoice and purchase order?				Invoices reach the buying firm's accounting department mostly through mail. Sometimes they are sent to the purchaser who has to forward them.	Most invoices are received electronically by the accounting department. There is partial integration with the accounting system. Manual intervention is still required to process and verify invoices.	A large share of invoices gets processed automatically. All deviations have to be checked by the purchasers manually, they are forwarded through a workflow in the ERP system.	All invoices arrive electronically directly in the accounting department and are paid automatically without manual checking. In case of deviations or mistakes, artificial intelligence is able to detect the issue and solve it. Only for large deviations the purchasing department gets involved. In this case, the invoice deviation is sent to the purchaser for checking through the ERP system.
Payment terms	Do you have fixed payment terms agreed with your suppliers and are they set up in your contracts? Do you make use of cash discounts? Do you have automatism to keep the payment terms?				Cash discounts are not actively used. Invoices are manually checked and paid according to the company's cashflow situation. Payment terms are accepted as proposed by the supplier.	If cash discounts are offered and the financial situation allows it, payments are processed accordingly. Payment due date are accepted as they are given by the supplier.	Cash discounts are applied. The invoice processing system is not able to prioritize invoices accordingly all the time, therefore sometimes time gets lost and cash discounts cannot be applied anymore.	Payment terms and information on cash discounts is set in the system and are actively negotiated with suppliers. The payment happens automatically based on this information and prioritises processing of invoices accordingly.
Compliance		0%	0.0					
Rules for invoice payment	Is every invoice matched to an order? Are there guidelines which refuse to pay any invoices without an order created by the purchasing department (maverick buying)?				Invoices are checked manually and do not require an order. In case checking is required, it is forwarded to the internal customer for approval. Invoices can be paid for materials or services without any information to purchasing.	Invoices can only be paid if there is a matching purchase order existing. The purchase order can be created afterwards, therefore the invoice requirement is only a formality.	Normally every invoice should be matched to a purchase order. For services the rules are more lenient and direct approval by the consumer is accepted. In this case a signed frame contract or similar document should be presented.	Invoices are paid in case a matching order exists. Invoices without a purchase orders are generally refused by company policy and not paid. PO creation afterwards is refused just for the purpose of invoice payment.
Score		0%	0.0					

Appendix 2: Interview questions

- Semi structured interview, therefore questions only served as guidance for the interviewer to cover certain topics -

Before interview:

- Clarifying operative excellence
- Asking for consent and whether the interview can be recorded. In case recording was agreed, it was started after that question
- Asking interviewee to introduce him/herself and the company

Q1a: *Which factors of operative excellence are relevant for supplier satisfaction in indirect procurement?*

- What makes up operational efficiency/excellence for you?
(if not mentioned: Forecasting, payment, contact accessibility, process quality, order process)
- Which areas have the biggest potential for improvement in your opinion?

Q1b: *Why can operative excellence increase supplier satisfaction in indirect procurement*

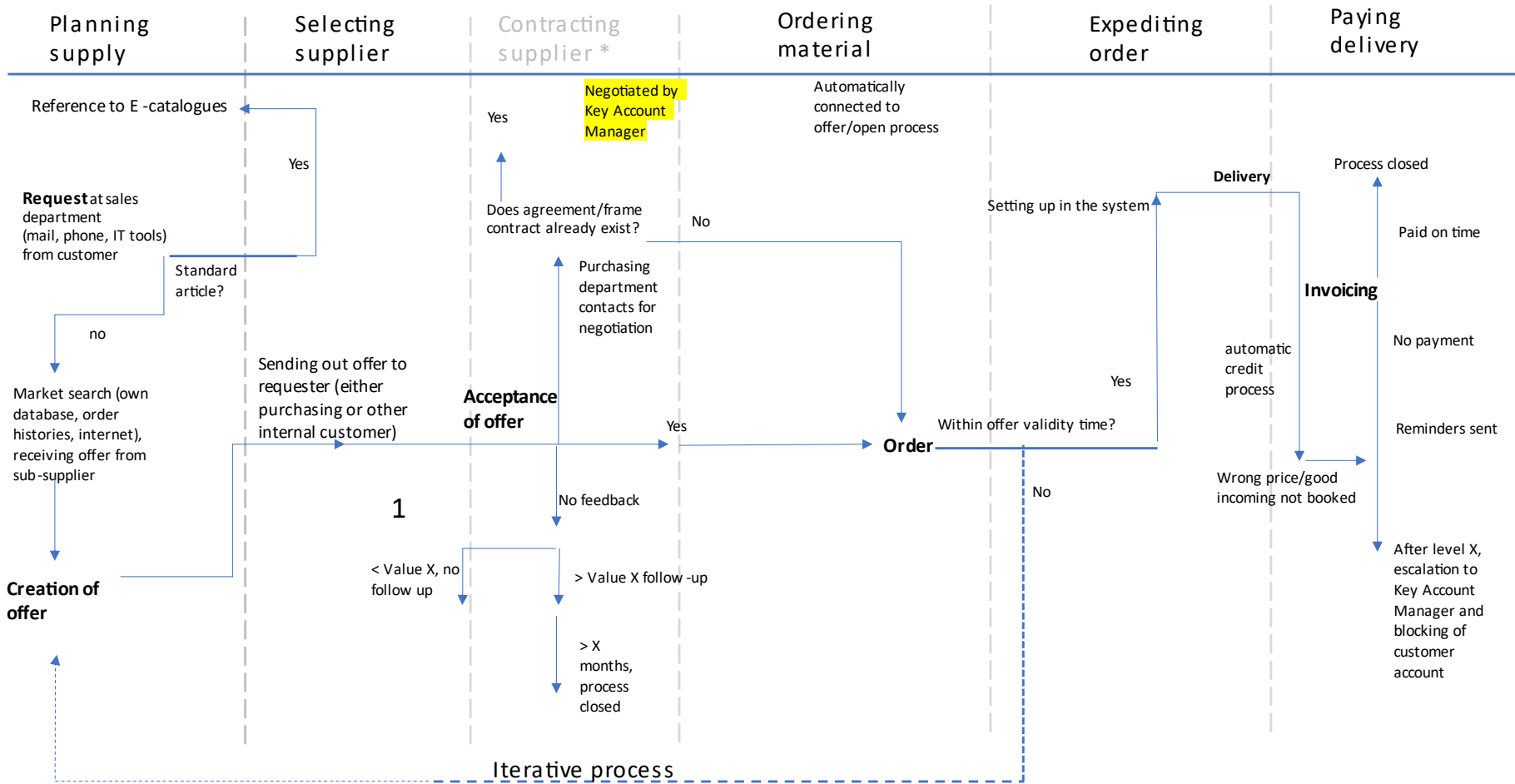
- How is information about the customer internally exchanged? (mail, IT)
- Where do problems occur most frequently?
➔ (Follow up if not mentioned: RFQ, Ordering, Payment etc.)
- If problem X occurs, what do your internal processes look like when this issue occurs?

Q2: *To what extent can the implementation of e-procurement tools be a facilitator to achieve operative excellence in indirect procurement?*

- Which e-solutions do you perceive as most beneficial for your operations?

- Which tools do you know of but did not implement yet?
- Which solutions do you use with other customers?
- Is there a large variety of different applications among your customers?

Appendix 3: Purchasing process from supplier's point of view



* Usually working with frame contracts which are negotiated once every X years not part of regular purchasing process